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*\*County specific computer generated reports.*

## ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Douglas County, Kansas: Published

Map symbol	Soil name	Acres	Percent
059BC	Bates Loam, 1 To 4 Percent Slopes-----	146	*
059BD	Bates-Collinsville Loams, 3 To 7 Percent Slopes-----	271	*
059BH	Bates-Collinsville Loams, 7 To 12 Percent Slopes-----	24	*
059BS	Bolivar-Hector Loams, 6 To 12 Percent Slopes-----	6	*
059CM	Clareson-Eram Silty Clay Loams, 3 To 15 Percent Slopes-----	477	0.2
059DN	Dennis-Bates Complex, 2 To 6 Percent Slopes-----	544	0.2
059EA	Eram-Lebo Silty Clay Loams, 7 To 12 Percent Slopes-----	20	*
059EC	Eram-Lula Complex, 3 To 7 Percent Slopes-----	103	*
059LN	Lebo-Rock Outcrop Complex, 20 To 40 Percent Slopes-----	7	*
059MB	Mason Silt Loam, 0 To 2 Percent Slopes, Rarely Flooded-----	15	*
059OS	Osage Silty Clay Loam, 0 To 2 Percent Slopes, Occasionally Flooded-----	4	*
059VB	Verdigris Silt Loam, 0 To 2 Percent Slopes, Occasionally Flooded-----	370	0.1
087EC	Eudora-Bismarckgrove Complex, 0 To 3 Percent Slopes, Overwash, Occasionally Flooded-----	384	0.1
087FU	Fluvaquents-----	100	*
087MU	Muscotah Silty Clay Loam, 0 To 1 Percent Slopes, Very Rarely Flooded-----	6	*
091EB	Eudora Soils, Overwash, Rarely Flooded-----	1,165	0.4
091MC	Morrill Loam, 3 To 8 Percent Slopes-----	100	*
139CM	Clareson-Eram Complex, 3 To 15 Percent Slopes-----	29	*
139ED	Elmont Loam, 3 To 7 Percent Slopes-----	1	*
139LU	Lula Silt Loam, 1 To 3 Percent Slopes-----	306	0.1
177MF	Martin Silty Clay Loam, 7 To 11 Percent Slopes-----	15	*
177SW	Vinland-Rock Outcrop Complex, 15 To 45 Percent Slopes-----	298	*
601KW	Konawa Fine Sandy Loam, 8 To 20 Percent Slopes-----	150	*
601SA	Sarpy-Haynie Complex, 0 To 3 Percent Slopes, Occasionally Flooded-----	7	*
2326	Kenoma Silt Loam, 1 To 4 Percent Slopes-----	508	0.2
2540	Leanna Silt Loam, 0 To 2 Percent Slopes, Occasionally Flooded-----	116	*
2797	Morrill-Gravelly Loam, 4 To 20 Percent Slopes, Stony-----	278	*
3460	Sibleyville-Vinland Complex, 7 To 15 Percent Slopes-----	29	*
3461	Sibleyville Loam, 3 To 7 Percent Slopes, Eroded-----	94	*
3462	Sibleyville Loam, 3 To 7 Percent Slopes-----	775	0.3
3464	Sibleyville-Vinland Loams, 3 To 7 Percent Slopes-----	11	*
3494	Summit Silty Clay Loam, 1 To 4 Percent Slopes-----	19	*
3495	Summit Silty Clay Loam, 4 To 8 Percent Slopes-----	233	*
3815	Verdigris Silt Loam, 0 To 2 Percent Slopes, Frequently Flooded-----	329	0.1
3926	Water-----	11	*
3951	Woodson Silt Loam, 1 To 3 Percent Slopes-----	4,659	1.5
AED	Arents, Earthen Dam-----	184	*
Be	Basehor Complex, 7 To 15 Percent Slopes-----	3,296	1.1
BOP	Borrow Pits-----	458	0.2
Et	Eudora Silt Loam, Rarely Flooded-----	1,572	0.5
Ev	Eudora-Kimo Complex, Rarely Flooded-----	7,495	2.5
Ew	Eudora-Kimo Fine Sandy Loams, Rarely Flooded, Overwash-----	2,191	0.7
Gm	Gymer Silt Loam, 1 To 3 Percent Slopes-----	3,569	1.2
Gy	Gymer Silt Loam, 3 To 8 Percent Slopes-----	3,024	1.0
Ju	Judson Silt Loam, Rarely Flooded-----	1,253	0.4
KA	Kennebec Silt Loam, Channeled-----	150	*
Kb	Kennebec Silt Loam, Occasionally Flooded-----	6,813	2.2
Kc	Kennebec Soils, Channeled-----	11,508	3.8
Km	Kimo Silty Clay Loam, Rarely Flooded-----	1,171	0.4
Le	Leanna Silt Loam, 0 To 2 Percent Slopes, Occasionally Flooded-----	1,016	0.3
M-W	Miscellaneous Water-----	62	*
Mb	Martin Silty Clay Loam, 1 To 3 Percent Slopes-----	4,398	1.4
Mc	Martin Silty Clay Loam, 3 To 7 Percent Slopes-----	41,944	13.8
Mh	Martin Soils, 3 To 7 Percent Slopes, Eroded-----	7,294	2.4
Mo	Martin-Oska Silty Clay Loams, 3 To 6 Percent Slopes-----	13,999	4.6
Mr	Morrill Clay Loam, 3 To 7 Percent Slopes-----	3,606	1.2
Ms	Morrill Clay Loam, 7 To 12 Percent Slopes-----	548	0.2
Oe	Oska Silty Clay Loam, 3 To 6 Percent Slopes-----	15,109	5.0
Pb	Pawnee Clay Loam, 1 To 3 Percent Slopes-----	1,492	0.5
Pc	Pawnee Clay Loam, 3 To 7 Percent Slopes-----	11,021	3.6
Ph	Pawnee Clay Loam, 3 To 7 Percent Slopes, Eroded-----	542	0.2
QUA	Quarries-----	339	0.1
Re	Reading Silt Loam, 0 To 2 Percent Slopes, Rarely Flooded-----	4,868	1.6
Ro	Riverwash-----	524	0.2
Sa	Sand Pit-----	6	*
Sb	Sarpy-Eudora Complex, Overwash, Occasionally Flooded-----	2,181	0.7
Sc	Sharpsburg Silt Loam, 1 To 4 Percent Slopes-----	643	0.2
Sd	Sharpsburg Silt Loam, 4 To 10 Percent Slopes-----	1,302	0.4
Sh	Sibleyville Loam, 3 To 7 Percent Slopes-----	15,339	5.0
So	Sibleyville Loam, 3 To 7 Percent Slopes, Eroded-----	1,443	0.5
Ss	Sibleyville Complex, 3 To 7 Percent Slopes-----	10,399	3.4
St	Sibleyville Complex, 3 To 7 Percent Slopes, Eroded-----	877	0.3
SU	Summit Silty Clay Loam, 3 To 7 Percent Slopes-----	4,430	1.5
Sv	Sibleyville Complex, 7 To 15 Percent Slopes-----	3,783	1.2
SVV	Sibleyville-Vinland Loams, 3 To 7 Percent Slopes-----	59	*
Sw	Sogn-Vinland Complex, 5 To 20 Percent Slopes-----	14,476	4.8
Sx	Vinland-Rock Outcrop Complex, 20 To 40 Percent Slopes-----	10,935	3.6
Tc	Thurman Complex, 4 To 10 Percent Slopes-----	408	0.1
VA	Verdigris Silt Loam, Channeled-----	792	0.3
Vc	Vinland Complex, 3 To 7 Percent Slopes-----	3,969	1.3
Vh	Vinland Complex, 3 To 7 Percent Slopes, Eroded-----	863	0.3
Vm	Vinland-Martin Complex, 7 To 15 Percent Slopes-----	19,319	6.4
W	Water (less Than 40 Acres In Size)-----	11,257	3.7
Wc	Wabash Silty Clay Loam, Occasionally Flooded-----	5,936	2.0
Wh	Wabash Silty Clay, Occasionally Flooded-----	6,530	2.1
Wo	Woodson Silt Loam, 0 To 1 Percent Slopes-----	1,214	0.4
Ws	Woodson Silt Loam, 1 To 3 Percent Slopes-----	26,225	8.6
Wx	Woodson Silty Clay Loam, 1 To 3 Percent Slopes, Eroded-----	366	0.1

## ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

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Map symbol	Soil name	Acres	Percent
	Total-----	303,808	100.0

\* Less than 0.1 percent.

Nontechnical Soil Descriptions  
Douglas County, Kansas

Nontechnical soil descriptions describe soil properties or management considerations specific to a soil map unit or group of map units, shown in the NonTechnical Descriptions report. These descriptions are written in terminology that Non-technical users of soil survey information can understand. Nontechnical soil descriptions are a powerful tool for creating reports. These high quality, easy to read reports can be generated by conservation planners and other NRCS employees for distribution to land users. Soil map unit descriptions and National Soil Information System records are the basis for these descriptions.

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059BC Bates Loam, 1 To 4 Percent Slopes

Bates soil makes up 90 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a gently sloping to moderately sloping hillslope on upland. The runoff class is low. The parent material consists of sandy and silty residuum weathered from sandstone, unspecified over sandy and silty residuum weathered from sandstone-shale. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. It has a moderate available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 2e.

059BD Bates-Collinsville Loams, 3 To 7 Percent Slopes

Bates soil makes up 60 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is medium. The parent material consists of sandy and silty residuum weathered from sandstone over sandy and silty residuum weathered from sandstone and shale. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. It has a moderate available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 4e.

Collinsville soil makes up 25 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is low. The parent material consists of loamy residuum weathered from sandstone. The soil is 4 to 20 inches deep to bedrock (lithic). This soil is well drained. The slowest permeability is moderately rapid. It has a very low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Shallow Sandstone (pe35-42) range site. It is in the nonirrigated land capability classification .

059BH Bates-Collinsville Loams, 7 To 12 Percent Slopes

Bates soil makes up 50 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a strongly sloping backslope hillslope on upland. The runoff class is medium. The parent material consists of sandy and silty residuum weathered from sandstone over sandy and silty residuum weathered from sandstone and shale. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. It has a moderate available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 6s.

Collinsville soil makes up 35 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a strongly sloping backslope hillslope on upland. The runoff class is low. The parent material consists of loamy residuum weathered from sandstone. The soil is 4 to 20 inches deep to bedrock (lithic). This soil is well drained. The slowest permeability is moderately rapid. It has a very low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Shallow Sandstone (pe35-42) range site. It is in the nonirrigated land capability classification 7s.

059BS Bolivar-Hector Loams, 6 To 12 Percent Slopes

Bolivar soil makes up 50 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping backslope hillslope on upland. The runoff class is medium. The parent material consists of loamy residuum weathered from sandstone. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. It has a low available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Savannah (pe35-42) range site. It is in the nonirrigated land capability classification 6e.

Hector soil makes up 40 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping backslope hillslope on upland. The runoff class is low. The parent material consists of loamy residuum weathered from sandstone. The soil is 10 to 20 inches deep to bedrock (lithic). This soil is well drained. The slowest permeability is moderately rapid. It has a very low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Shallow Savannah (pe35-42) range site. It is in the nonirrigated land capability classification 7e.

Nontechnical Soil Descriptions--Continued  
Douglas County, Kansas

059CM Clareson-Eram Silty Clay Loams, 3 To 15 Percent Slopes

Clareson soil makes up 55 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep backslope hillslope on upland. The runoff class is very high. The parent material consists of silty and clayey residuum weathered from limestone. The soil is 20 to 40 inches deep to bedrock (lithic). This soil is well drained. The slowest permeability is slow. It has a low available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Shallow Flats (pe35-42) range site. It is in the nonirrigated land capability classification 6e.

Eram soil makes up 30 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping backslope hillslope on upland. The runoff class is very high. The parent material consists of silty and clayey residuum weathered from shale. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is moderately well drained. The slowest permeability is slow. It has a low available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 12 inches. This soil is in the Clay Upland (pe35-42) range site. It is in the nonirrigated land capability classification 6e.

059DN Dennis-Bates Complex, 2 To 6 Percent Slopes

Dennis soil makes up 60 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a gently sloping to moderately sloping backslope hillslope on upland. The runoff class is high. The parent material consists of silty and clayey residuum weathered from shale. This soil is moderately well drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 15 inches. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 3e.

Bates soil makes up 30 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a gently sloping to moderately sloping backslope hillslope on upland. The runoff class is low. The parent material consists of sandy and silty residuum weathered from sandstone over sandy and silty residuum weathered from sandstone and shale. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. It has a moderate available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 3e.

059EA Eram-Lebo Silty Clay Loams, 7 To 12 Percent Slopes

Eram soil makes up 55 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a strongly sloping backslope hillslope on upland. The runoff class is very high. The parent material consists of silty and clayey residuum weathered from shale. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is moderately well drained. The slowest permeability is slow. It has a low available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 12 inches. This soil is in the Clay Upland (pe35-42) range site. It is in the nonirrigated land capability classification 6e.

Lebo soil makes up 35 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a strongly sloping backslope hillslope on upland. The runoff class is medium. The parent material consists of loamy residuum weathered from sandstone and shale. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. It has a low available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 6e.

059EC Eram-Lula Complex, 3 To 7 Percent Slopes

Eram soil makes up 60 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping backslope hillslope on upland. The runoff class is high. The parent material consists of silty and clayey residuum weathered from shale. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is moderately well drained. The slowest permeability is slow. It has a low available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 12 inches. This soil is in the Clay Upland (pe35-42) range site. It is in the nonirrigated land capability classification 4e.

Lula soil makes up 25 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping summit, backslope hillslope on upland. The runoff class is high. The parent material consists of fine-silty residuum weathered from limestone. The soil is 40 to 60 inches deep to bedrock (lithic). This soil is well drained. The slowest permeability is moderate. It has a moderate available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 3e.

059LN Lebo-Rock Outcrop Complex, 20 To 40 Percent Slopes

Lebo soil makes up 75 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a steep to steep backslope hillslope on upland. The runoff class is high. The parent material consists of residuum weathered from shale-sandstone. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. It has a low available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 7e.

Nontechnical Soil Descriptions--Continued  
Douglas County, Kansas

059MB Mason Silt Loam, 0 To 2 Percent Slopes, Rarely Flooded

Mason soil makes up 90 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a nearly level stream terrace on river valley. The runoff class is low. The parent material consists of fine-silty alluvium. This soil is well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is rarely flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Lowland (pe35-42) range site. It is in the nonirrigated land capability classification 1.

059OS Osage Silty Clay Loam, 0 To 2 Percent Slopes, Occasionally Flooded

Osage soil makes up 85 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on river valley. The runoff class is high. The parent material consists of clayey alluvium. This soil is poorly drained. The slowest permeability is very slow. It has a moderate available water capacity and a very high shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 6 inches. This soil is in the Loamy Lowland (pe35-42) range site. It is in the nonirrigated land capability classification 2w.

059VB Verdigris Silt Loam, 0 To 2 Percent Slopes, Occasionally Flooded

Verdigris soil makes up 85 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on river valley. The runoff class is low. The parent material consists of fine-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is occasionally flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Lowland (pe35-42) range site. It is in the nonirrigated land capability classification 2w.

087EC Eudora-Bismarckgrove Complex, 0 To 3 Percent Slopes, Overwash, Occasionally Flooded

Eudora soil makes up 65 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood-plain step on river valley. The runoff class is low. The parent material consists of coarse-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a low shrink swell potential. This soil is occasionally flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 2w.

Bismarckgrove soil makes up 20 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood-plain step on river valley. The runoff class is low. The parent material consists of fine-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a high available water capacity and a moderate shrink swell potential. This soil is occasionally flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Loamy Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 2w.

087FU Fluvaquents

Fluvaquents soil makes up 100 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level to moderately sloping flood plain on valley. The runoff class is low. The parent material consists of coarse-silty alluvium. This soil is moderately well drained. The slowest permeability is moderate. It has a high available water capacity and a low shrink swell potential. This soil is frequently flooded and is not ponded. The top of the seasonal high water table is at 28 inches. The soil contains a maximum amount of 15 percent calcium carbonate. It is in the nonirrigated land capability classification 5w.

087MU Muscotah Silty Clay Loam, 0 To 1 Percent Slopes, Very Rarely Flooded

Muscotah soil makes up 85 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level terrace on river valley. The runoff class is very high. The parent material consists of clayey alluvium. This soil is somewhat poorly drained. The slowest permeability is very slow. It has a high available water capacity and a high shrink swell potential. This soil is very rare flooded and is not ponded. The top of the seasonal high water table is at 27 inches. The soil contains a maximum amount of 2 percent calcium carbonate. This soil is in the irrigated land capability class 2w. It is in the nonirrigated land capability classification 2w.

091EB Eudora Soils, Overwash, Rarely Flooded

Eudora soil makes up 85 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on river valley. The runoff class is low. The parent material consists of coarse-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a low shrink swell potential. This soil is rarely flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 1.

Nontechnical Soil Descriptions--Continued  
Douglas County, Kansas

091MC Morrill Loam, 3 To 8 Percent Slopes

Morrill soil makes up 85 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping hillslope on upland. The runoff class is medium. The parent material consists of fine-loamy glaciofluvial deposits. This soil is well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 3e.

139CM Clareson-Eram Complex, 3 To 15 Percent Slopes

Clareson soil makes up 55 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep hillslope on upland. The runoff class is very high. The parent material consists of silty and clayey residuum weathered from limestone. The soil is 20 to 40 inches deep to bedrock (lithic). This soil is well drained. The slowest permeability is slow. It has a low available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Shallow Flats (pe35-42) range site. It is in the nonirrigated land capability classification 6e.

Eram soil makes up 30 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping backslope hillslope on upland. The runoff class is very high. The parent material consists of silty and clayey residuum weathered from shale. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is moderately well drained. The slowest permeability is slow. It has a low available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 12 inches. This soil is in the Clay Upland (pe35-42) range site. It is in the nonirrigated land capability classification 6e.

139ED Elmont Loam, 3 To 7 Percent Slopes

Elmont soil makes up 85 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is medium. The parent material consists of silty and clayey residuum weathered from shale and siltstone. The soil is 40 to 60 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 3e.

139LU Lula Silt Loam, 1 To 3 Percent Slopes

Lula soil makes up 85 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a gently sloping summit hillslope on upland. The runoff class is high. The parent material consists of residuum weathered from limestone. The soil is 40 to 60 inches deep to bedrock (lithic). This soil is well drained. The slowest permeability is moderate. It has a moderate available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 2e.

177MF Martin Silty Clay Loam, 7 To 11 Percent Slopes

Martin soil makes up 90 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a strongly sloping hillslope on upland. The runoff class is very high. The parent material consists of silty and clayey colluvium derived from limestone and shale over silty and clayey residuum weathered from limestone and shale. This soil is moderately well drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 24 inches. The soil contains a maximum amount of 1 percent calcium carbonate. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 4e.

177SW Vinland-Rock Outcrop Complex, 15 To 45 Percent Slopes

Vinland soil makes up 26 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately steep to steep hillslope on upland. The runoff class is medium. The parent material consists of sandy and silty residuum weathered from shale. The soil is 10 to 20 inches deep to bedrock (paralithic). This soil is somewhat excessively drained. The slowest permeability is moderate. It has a low available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 6e.

601KW Konawa Fine Sandy Loam, 8 To 20 Percent Slopes

Konawa soil makes up 90 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a strongly sloping to moderately steep hillslope on upland. The runoff class is medium. The parent material consists of fine-loamy glaciofluvial deposits. This soil is well drained. The slowest permeability is moderate. It has a moderate available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Savannah (pe30-37) range site. It is in the nonirrigated land capability classification 6e.



Nontechnical Soil Descriptions--Continued  
Douglas County, Kansas

601SA Sarpy-Haynie Complex, 0 To 3 Percent Slopes, Occasionally Flooded

Sarpy soil makes up 55 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on river valley. The runoff class is negligible. The parent material consists of sandy alluvium. This soil is somewhat excessively drained. The slowest permeability is rapid. It has a low available water capacity and a low shrink swell potential. This soil is occasionally flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Sandy Lowland (pe35-37) range site. It is in the nonirrigated land capability classification 3w.

Haynie soil makes up 35 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on river valley. The runoff class is very low. The parent material consists of coarse-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a high available water capacity and a low shrink swell potential. This soil is occasionally flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 30 percent calcium carbonate. This soil is in the Loamy Lowland (pe35-37) range site. It is in the nonirrigated land capability classification 2w.

2326 Kenoma Silt Loam, 1 To 4 Percent Slopes

Kenoma soil makes up 90 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a gently sloping to moderately sloping backslope hillslope on upland. The runoff class is very high. The parent material consists of silty and clayey sediments. This soil is moderately well drained. The slowest permeability is very slow. It has a moderate available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 12 inches. This soil contains a very slightly saline horizon. This soil is in the Clay Upland (pe35-42) range site. It is in the nonirrigated land capability classification 3e.

2540 Leanna Silt Loam, 0 To 2 Percent Slopes, Occasionally Flooded

Leanna soil makes up 85 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a gently sloping toeslope flood plain on valley. The runoff class is low. The parent material consists of silty and clayey alluvium. This soil is somewhat poorly drained. The slowest permeability is very slow. It has a high available water capacity and a high shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 6 inches. This soil is in the Clay Lowland (pe35-42) range site. It is in the nonirrigated land capability classification 2w.

2797 Morrill-Gravelly Loam, 4 To 20 Percent Slopes, Stony

Morrill, stony, soil makes up 85 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep hillslope on upland. The runoff class is high. The parent material consists of fine-loamy glaciofluvial deposits. This soil is well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 6e.

3460 Sibleyville-Vinland Complex, 7 To 15 Percent Slopes

Sibleyville soil makes up 50 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a strongly sloping to moderately steep backslope hillslope on upland. The runoff class is medium. The parent material consists of loamy residuum weathered from sandstone. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. It has a low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 6e.

Vinland soil makes up 35 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a strongly sloping to moderately steep backslope hillslope on upland. The runoff class is medium. The parent material consists of loamy residuum weathered from shale and siltstone. The soil is 10 to 20 inches deep to bedrock (paralithic). This soil is somewhat excessively drained. The slowest permeability is moderate. It has a low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 6e.

3461 Sibleyville Loam, 3 To 7 Percent Slopes, Eroded

Sibleyville, eroded, soil makes up 85 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping backslope hillslope on upland. The runoff class is medium. The parent material consists of loamy residuum weathered from sandstone. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. It has a low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 4e.

Nontechnical Soil Descriptions--Continued  
Douglas County, Kansas

3462 Sibleyville Loam, 3 To 7 Percent Slopes

Sibleyville soil makes up 85 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping backslope hillslope on upland. The runoff class is medium. The parent material consists of loamy residuum weathered from sandstone. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. It has a low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 3e.

3464 Sibleyville-Vinland Loams, 3 To 7 Percent Slopes

Sibleyville soil makes up 50 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping backslope hillslope on upland. The runoff class is medium. The parent material consists of residuum weathered from sandstone. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. It has a low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 4e.

Vinland soil makes up 30 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping backslope hillslope on upland. The runoff class is medium. The parent material consists of residuum weathered from shale and siltstone. The soil is 10 to 20 inches deep to bedrock (paralithic). This soil is somewhat excessively drained. The slowest permeability is moderate. It has a low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 6e.

3494 Summit Silty Clay Loam, 1 To 4 Percent Slopes

Summit soil makes up 85 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a gently sloping to moderately sloping footslope, backslope hillslope on upland. The runoff class is high. The parent material consists of silty and clayey residuum weathered from acid shale. This soil is moderately well drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 30 inches. This soil is in the Clay Upland (pe35-42) range site. It is in the nonirrigated land capability classification 2e.

3495 Summit Silty Clay Loam, 4 To 8 Percent Slopes

Summit soil makes up 85 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping backslope hillslope on upland. The runoff class is very high. The parent material consists of silty and clayey residuum weathered from acid shale. This soil is moderately well drained. The slowest permeability is slow. It has a moderate available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 24 inches. This soil is in the Clay Upland (pe35-42) range site. It is in the nonirrigated land capability classification 3e.

3815 Verdigris Silt Loam, 0 To 2 Percent Slopes, Frequently Flooded

Verdigris soil makes up 85 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on valley. The runoff class is low. The parent material consists of fine-silty alluvium. This soil is moderately well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is frequently flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Lowland (pe35-42) range site. It is in the nonirrigated land capability classification 5w.

3951 Woodson Silt Loam, 1 To 3 Percent Slopes

Woodson soil makes up 85 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a gently sloping summit paleoterrace on upland. The runoff class is medium. The parent material consists of silty and clayey sediments. This soil is somewhat poorly drained. The slowest permeability is very slow. It has a moderate available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 6 inches. This soil is in the Clay Upland (pe35-42) range site. It is in the nonirrigated land capability classification 3e.

Be Basehor Complex, 7 To 15 Percent Slopes

Basehor soil makes up 50 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a strongly sloping to moderately steep hillslope on upland. The runoff class is low. The parent material consists of loamy residuum weathered from sandstone. The soil is 8 to 20 inches deep to bedrock (lithic). This soil is well drained. The slowest permeability is moderately rapid. It has a very low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Shallow Savannah (pe30-37) range site. It is in the nonirrigated land capability classification 6s.

Nontechnical Soil Descriptions--Continued  
Douglas County, Kansas

Et Eudora Silt Loam, Rarely Flooded

Eudora soil makes up 90 percent of the map unit. This map unit is in the This soil occurs on a nearly level flood plain on river valley. The runoff class is low. The parent material consists of coarse-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a low shrink swell potential. This soil is rarely flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 1.

Ev Eudora-Kimo Complex, Rarely Flooded

Eudora soil makes up 60 percent of the map unit. This map unit is in the This soil occurs on a nearly level to gently sloping flood plain on river valley. The runoff class is low. The parent material consists of coarse-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a low shrink swell potential. This soil is rarely flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 2w.

Kimo soil makes up 30 percent of the map unit. This map unit is in the This soil occurs on a nearly level flood plain on river valley. The runoff class is medium. The parent material consists of clayey over loamy alluvium. This soil is somewhat poorly drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is rarely flooded and is not ponded. The top of the seasonal high water table is at 24 inches. This soil is in the Clay Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 2w.

Ew Eudora-Kimo Fine Sandy Loams, Rarely Flooded, Overwash

Eudora soil makes up 65 percent of the map unit. This map unit is in the This soil occurs on a nearly level to gently sloping flood plain on river valley. The runoff class is low. The parent material consists of coarse-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a high available water capacity and a low shrink swell potential. This soil is rarely flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 1.

Kimo soil makes up 25 percent of the map unit. This map unit is in the This soil occurs on a nearly level flood plain on river valley. The runoff class is medium. The parent material consists of silty and clayey alluvium. This soil is poorly drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is rarely flooded and is not ponded. The top of the seasonal high water table is at 48 inches. This soil is in the Clay Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 2w.

Gm Gymer Silt Loam, 1 To 3 Percent Slopes

Gymer soil makes up 85 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Cherokee Prairies Major Land Resource Area. This soil occurs on a gently sloping hillslope on upland. The runoff class is medium. The parent material consists of silty and clayey residuum weathered from limestone and shale. This soil is well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 2e.

Gy Gymer Silt Loam, 3 To 8 Percent Slopes

Gymer soil makes up 88 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping backslope terrace on river valley. The runoff class is high. The parent material consists of fine-silty alluvium. This soil is well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 3e.

Ju Judson Silt Loam, Rarely Flooded

Judson soil makes up 85 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level terrace on river valley. The runoff class is negligible. The parent material consists of fine-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is rarely flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 1.

KA Kennebec Silt Loam, Channeled

Kennebec soil makes up 99 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on valley. The runoff class is low. The parent material consists of fine-silty alluvium. This soil is moderately well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is frequently flooded and is not ponded. The top of the seasonal high water table is at 48 inches. It is in the nonirrigated land capability classification 5w.

Nontechnical Soil Descriptions--Continued  
Douglas County, Kansas

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**Kb Kennebec Silt Loam, Occasionally Flooded**

Kennebec soil makes up 95 percent of the map unit. This map unit is in the This soil occurs on a nearly level to gently sloping flood plain on valley. The runoff class is low. The parent material consists of fine-silty alluvium. This soil is moderately well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 42 inches. This soil is in the Loamy Lowland (pe35-42) range site. It is in the nonirrigated land capability classification 2w.

**Kc Kennebec Soils, Channeled**

Kennebec soil makes up 88 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a nearly level flood plain on river valley. The runoff class is low. The parent material consists of silty alluvium. This soil is moderately well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is frequently flooded and is not ponded. The top of the seasonal high water table is at 42 inches. This soil is in the Loamy Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 5w.

**Km Kimo Silty Clay Loam, Rarely Flooded**

Kimo soil makes up 90 percent of the map unit. This map unit is in the This soil occurs on a nearly level flood plain on river valley. The runoff class is medium. The parent material consists of clayey over loamy alluvium. This soil is somewhat poorly drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is rarely flooded and is not ponded. The top of the seasonal high water table is at 24 inches. This soil is in the Clay Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 2w.

**Le Leanna Silt Loam, 0 To 2 Percent Slopes, Occasionally Flooded**

Leanna soil makes up 85 percent of the map unit. This map unit is in the This soil occurs on a nearly level to gently sloping flood plain on river valley. The runoff class is high. The parent material consists of silty and clayey alluvium. This soil is somewhat poorly drained. The slowest permeability is very slow. It has a high available water capacity and a high shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 15 inches. This soil is in the Loamy Lowland (pe35-42) range site. It is in the nonirrigated land capability classification 2w.

**Mb Martin Silty Clay Loam, 1 To 3 Percent Slopes**

Martin soil makes up 90 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Cherokee Prairies Major Land Resource Area. This soil occurs on a gently sloping hillslope on upland. The runoff class is high. The parent material consists of silty and clayey colluvium derived from limestone and shale over silty and clayey residuum weathered from limestone and shale. This soil is moderately well drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 24 inches. The soil contains a maximum amount of 1 percent calcium carbonate. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 2e.

**Mc Martin Silty Clay Loam, 3 To 7 Percent Slopes**

Martin soil makes up 85 percent of the map unit. This map unit is in the Cherokee Prairies Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping backslope hillslope on upland. The runoff class is high. The parent material consists of silty and clayey colluvium derived from limestone and shale over silty and clayey residuum weathered from limestone and shale. This soil is moderately well drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 24 inches. The soil contains a maximum amount of 1 percent calcium carbonate. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 3e.

**Mh Martin Soils, 3 To 7 Percent Slopes, Eroded**

Martin, eroded, soil makes up 85 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is high. The parent material consists of silty and clayey colluvium derived from limestone and shale over silty and clayey residuum weathered from limestone and shale. This soil is moderately well drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 4e.

**Mo Martin-Oska Silty Clay Loams, 3 To 6 Percent Slopes**

Martin soil makes up 40 percent of the map unit. This map unit is in the Cherokee Prairies Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is high. The parent material consists of silty and clayey colluvium derived from limestone and shale over silty and clayey residuum weathered from limestone and shale. This soil is moderately well drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 24 inches. The soil contains a maximum amount of 1 percent calcium carbonate. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 3e.

Nontechnical Soil Descriptions--Continued  
Douglas County, Kansas

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Oska soil makes up 30 percent of the map unit. This map unit is in the Cherokee Prairies Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is high. The parent material consists of silty and clayey residuum weathered from limestone and shale. The soil is 20 to 40 inches deep to bedrock (lithic). This soil is well drained. The slowest permeability is slow. It has a moderate available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 3e.

Mr Morrill Clay Loam, 3 To 7 Percent Slopes

Morrill soil makes up 90 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is medium. The parent material consists of fine-loamy glaciofluvial deposits. This soil is well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 3e.

Ms Morrill Clay Loam, 7 To 12 Percent Slopes

Morrill soil makes up 85 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a strongly sloping hillslope on upland. The runoff class is high. The parent material consists of fine-loamy glaciofluvial deposits. This soil is well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 4e.

Oe Oska Silty Clay Loam, 3 To 6 Percent Slopes

Oska soil makes up 88 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is high. The parent material consists of silty and clayey residuum weathered from limestone and shale. The soil is 20 to 40 inches deep to bedrock (lithic). This soil is well drained. The slowest permeability is slow. It has a moderate available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 3e.

Pb Pawnee Clay Loam, 1 To 3 Percent Slopes

Pawnee soil makes up 90 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a gently sloping shoulder, backslope hillslope on upland. The runoff class is high. The parent material consists of clayey drift. This soil is moderately well drained. The slowest permeability is slow. It has a moderate available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 12 inches. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Clay Upland (pe30-37) range site. It is in the nonirrigated land capability classification 2e.

Pc Pawnee Clay Loam, 3 To 7 Percent Slopes

Pawnee soil makes up 85 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping backslope hillslope on upland. The runoff class is high. The parent material consists of clayey drift. This soil is moderately well drained. The slowest permeability is slow. It has a moderate available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 12 inches. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Clay Upland (pe30-37) range site. It is in the nonirrigated land capability classification 3e.

Ph Pawnee Clay Loam, 3 To 7 Percent Slopes, Eroded

Pawnee, eroded, soil makes up 90 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping backslope hillslope on upland. The runoff class is high. The parent material consists of clayey drift. This soil is moderately well drained. The slowest permeability is slow. It has a moderate available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 12 inches. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Clay Upland (pe30-37) range site. It is in the nonirrigated land capability classification 3e.

Re Reading Silt Loam, 0 To 2 Percent Slopes, Rarely Flooded

Reading soil makes up 90 percent of the map unit. This map unit is in the This soil occurs on a nearly level to gently sloping terrace on river valley. The runoff class is low. The parent material consists of fine-silty alluvium. This soil is well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is rarely flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Lowland (pe35-42) range site. It is in the nonirrigated land capability classification 1.

Nontechnical Soil Descriptions--Continued  
Douglas County, Kansas

Sb Sarpy-Eudora Complex, Overwash, Occasionally Flooded

Sarpy soil makes up 55 percent of the map unit. This map unit is in the This soil occurs on a nearly level flood plain on river valley. The runoff class is negligible. The parent material consists of sandy alluvium. This soil is excessively drained. The slowest permeability is rapid. It has a low available water capacity and a low shrink swell potential. This soil is occasionally flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Sandy Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 3w.

Eudora soil makes up 45 percent of the map unit. This map unit is in the This soil occurs on a nearly level flood plain on river valley. The runoff class is low. The parent material consists of coarse-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a high available water capacity and a low shrink swell potential. This soil is occasionally flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 3w.

Sc Sharpsburg Silt Loam, 1 To 4 Percent Slopes

Sharpsburg soil makes up 88 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a gently sloping to moderately sloping summit hillslope on upland. The runoff class is medium. The parent material consists of silty and clayey loess. This soil is moderately well drained. The slowest permeability is moderately slow. It has a high available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 2e.

Sd Sharpsburg Silt Loam, 4 To 10 Percent Slopes

Sharpsburg soil makes up 85 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping backslope hillslope on upland. The runoff class is high. The parent material consists of silty and clayey loess. This soil is moderately well drained. The slowest permeability is moderately slow. It has a high available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 3e.

Sh Sibleyville Loam, 3 To 7 Percent Slopes

Sibleyville soil makes up 90 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is medium. The parent material consists of sandy and silty residuum weathered from sandstone and shale. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. It has a low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 3e.

So Sibleyville Loam, 3 To 7 Percent Slopes, Eroded

Sibleyville, eroded, soil makes up 85 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping backslope hillslope on upland. The runoff class is medium. The parent material consists of loamy residuum weathered from sandstone. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. It has a low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 4e.

Ss Sibleyville Complex, 3 To 7 Percent Slopes

Sibleyville soil makes up 60 percent of the map unit. This map unit is in the Cherokee Prairies Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is medium. The parent material consists of sandy and silty residuum weathered from sandstone and shale. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. It has a low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 4e.

St Sibleyville Complex, 3 To 7 Percent Slopes, Eroded

Sibleyville, eroded, soil makes up 50 percent of the map unit. This map unit is in the Cherokee Prairies Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is medium. The parent material consists of sandy and silty residuum weathered from sandstone and shale. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. It has a low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 4e.

Nontechnical Soil Descriptions--Continued  
Douglas County, Kansas

SU Summit Silty Clay Loam, 3 To 7 Percent Slopes

Summit soil makes up 90 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a moderately sloping backslope hillslope on upland. The runoff class is high. The parent material consists of silty and clayey residuum weathered from calcareous shale. This soil is moderately well drained. The slowest permeability is slow. It has a moderate available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 24 inches. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 3e.

Sv Sibleyville Complex, 7 To 15 Percent Slopes

Sibleyville soil makes up 50 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Cherokee Prairies Major Land Resource Area. This soil occurs on a strongly sloping to moderately steep hillslope on upland. The runoff class is medium. The parent material consists of sandy and silty residuum weathered from sandstone and shale. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. It has a low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 6e.

SVV Sibleyville-Vinland Loams, 3 To 7 Percent Slopes

Sibleyville soil makes up 45 percent of the map unit. This map unit is in the Cherokee Prairies Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is medium. The parent material consists of sandy and silty residuum weathered from sandstone and shale. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. It has a low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 4e.

Vinland soil makes up 35 percent of the map unit. This map unit is in the Cherokee Prairies Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is medium. The parent material consists of sandy and silty residuum weathered from shale. The soil is 10 to 20 inches deep to bedrock (paralithic). This soil is somewhat excessively drained. The slowest permeability is moderate. It has a low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification .

Sw Sogn-Vinland Complex, 5 To 20 Percent Slopes

Sogn soil makes up 55 percent of the map unit. This map unit is in the Cherokee Prairies Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep hillslope on upland. The runoff class is medium. The parent material consists of loamy residuum weathered from limestone. The soil is 4 to 20 inches deep to bedrock (lithic). This soil is somewhat excessively drained. The slowest permeability is moderate. It has a very low available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Shallow Limy (pe35-42) range site. It is in the nonirrigated land capability classification 7s.

Vinland soil makes up 30 percent of the map unit. This map unit is in the Cherokee Prairies Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a strongly sloping to moderately steep hillslope on upland. The runoff class is medium. The parent material consists of loamy residuum weathered from shale. The soil is 10 to 20 inches deep to bedrock (paralithic). This soil is somewhat excessively drained. The slowest permeability is moderate. It has a low available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 6e.

Sx Vinland-Rock Outcrop Complex, 20 To 40 Percent Slopes

Vinland soil makes up 26 percent of the map unit. This map unit is in the This soil occurs on a steep to steep hillslope on upland. The runoff class is high. The parent material consists of sandy and silty residuum weathered from shale. The soil is 10 to 20 inches deep to bedrock (paralithic). This soil is somewhat excessively drained. The slowest permeability is moderate. It has a low available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 6e.

Tc Thurman Complex, 4 To 10 Percent Slopes

Thurman soil makes up 35 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping hillslope on upland. The runoff class is very low. The parent material consists of sandy eolian sands. This soil is excessively drained. The slowest permeability is rapid. It has a low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Savannah (pe30-37) range site. It is in the nonirrigated land capability classification 4e.

VA Verdigris Silt Loam, Channeled

Verdigris soil makes up 88 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on valley. The runoff class is low. The parent material consists of silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is frequently flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Lowland (pe35-42) range site. It is in the nonirrigated land capability classification 5w.

Nontechnical Soil Descriptions--Continued  
Douglas County, Kansas

Vc Vinland Complex, 3 To 7 Percent Slopes

Vinland soil makes up 50 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is medium. The parent material consists of sandy and silty residuum weathered from shale. The soil is 10 to 20 inches deep to bedrock (paralithic). This soil is somewhat excessively drained. The slowest permeability is moderate. It has a low available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe30-37) range site. It is in the nonirrigated land capability classification 6e.

Vh Vinland Complex, 3 To 7 Percent Slopes, Eroded

Vinland soil makes up 60 percent of the map unit. This map unit is in the Cherokee Prairies Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is medium. The parent material consists of sandy and silty residuum weathered from shale. The soil is 10 to 20 inches deep to bedrock (paralithic). This soil is somewhat excessively drained. The slowest permeability is moderate. It has a low available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 6e.

Vm Vinland-Martin Complex, 7 To 15 Percent Slopes

Vinland soil makes up 40 percent of the map unit. This map unit is in the Cherokee Prairies Nebraska and Kansas Loess-Drift Hills Major Land Resource Area. This soil occurs on a strongly sloping to moderately steep hillslope on upland. The runoff class is medium. The parent material consists of sandy and silty residuum weathered from shale. The soil is 10 to 20 inches deep to bedrock (paralithic). This soil is somewhat excessively drained. The slowest permeability is moderate. It has a low available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 6e.

Martin soil makes up 25 percent of the map unit. This map unit is in the Nebraska and Kansas Loess-Drift Hills Cherokee Prairies Major Land Resource Area. This soil occurs on a strongly sloping hillslope on upland. The runoff class is very high. The parent material consists of silty and clayey colluvium derived from limestone and shale over silty and clayey residuum weathered from limestone and shale. This soil is moderately well drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 24 inches. The soil contains a maximum amount of 1 percent calcium carbonate. This soil is in the Loamy Upland (pe35-42) range site. It is in the nonirrigated land capability classification 4e.

Wc Wabash Silty Clay Loam, Occasionally Flooded

Wabash soil makes up 88 percent of the map unit. This map unit is in the This soil occurs on a nearly level terrace on river valley. The runoff class is very high. The parent material consists of clayey alluvium. This soil is poorly drained. The slowest permeability is very slow. It has a moderate available water capacity and a very high shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 6 inches. This soil is in the Clay Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 3w.

Wh Wabash Silty Clay, Occasionally Flooded

Wabash soil makes up 90 percent of the map unit. This map unit is in the This soil occurs on a nearly level terrace on river valley. The runoff class is very high. The parent material consists of clayey alluvium. This soil is poorly drained. The slowest permeability is very slow. It has a moderate available water capacity and a very high shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 6 inches. This soil is in the Clay Lowland (pe30-37) range site. It is in the nonirrigated land capability classification 3w.

Wo Woodson Silt Loam, 0 To 1 Percent Slopes

Woodson soil makes up 90 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a nearly level divide on upland. The runoff class is very high. The parent material consists of silty and clayey alluvium over silty and clayey residuum weathered from clayey shale. This soil is somewhat poorly drained. The slowest permeability is very slow. It has a high available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 6 inches. This soil is in the Clay Upland (pe35-42) range site. It is in the nonirrigated land capability classification 2s.

Ws Woodson Silt Loam, 1 To 3 Percent Slopes

Woodson soil makes up 90 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a gently sloping divide on upland. The runoff class is very high. The parent material consists of silty and clayey alluvium over silty and clayey residuum weathered from clayey shale. This soil is somewhat poorly drained. The slowest permeability is very slow. It has a high available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 6 inches. This soil is in the Clay Upland (pe35-42) range site. It is in the nonirrigated land capability classification 3e.



Nontechnical Soil Descriptions--Continued  
Douglas County, Kansas

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Wx Woodson Silty Clay Loam, 1 To 3 Percent Slopes, Eroded

Woodson, eroded, soil makes up 90 percent of the map unit. This map unit is in the Cherokee Prairies Major Land Resource Area. This soil occurs on a gently sloping divide on upland. The runoff class is very high. The parent material consists of silty and clayey alluvium over silty and clayey residuum weathered from clayey shale. This soil is somewhat poorly drained. The slowest permeability is very slow. It has a moderate available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 6 inches. This soil is in the Clay Upland (pe35-42) range site. It is in the nonirrigated land capability classification 4e.

**059BC—Bates loam, 1 to 4 percent slopes****Map Unit Composition**

Bates: 90 percent  
 Minor components: 10 percent

**Component Descriptions****Bates**

*MLRA:* 112 - Cherokee Prairies

*Landform:* Hillslope on upland

*Parent material:* Sandy and silty residuum weathered from sandstone, unspecified over sandy and

silty residuum weathered from sandstone-shale

*Slope:* 1 to 4 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Slowest permeability:* Moderate (About 0.60 in/hr)

*Available water capacity:* Moderate (About 6.1 inches)

*Shrink-swell potential:* Low (About 1.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* Low

*Ecological site:* Loamy Upland (pe35-42)

*Land capability (nonirrigated):* 2e

**Typical Profile:**

H1—0 to 19 inches; loam

H2—19 to 34 inches; loam

H3—34 to 38 inches; gravelly loam

H4—38 to 42 inches; unweathered bedrock

**Minor Components****Dennis**

*Composition:* About 5 percent

*Geomorphic Position:* hillslope on upland

*Slope:* 2 to 6 percent

*Drainage class:* Moderately well drained

*Ecological site:* Loamy Upland (pe35-42)

**Kenoma**

*Composition:* About 5 percent

*Geomorphic Position:* hillslope on upland

*Slope:* 1 to 4 percent

*Drainage class:* Moderately well drained

*Ecological site:* Clay Upland (pe35-42)

**059BD—Bates-Collinsville loams, 3 to 7 percent slopes****Map Unit Composition**

Bates: 60 percent  
 Collinsville: 25 percent  
 Minor components: 15 percent

**Component Descriptions****Bates**

*MLRA:* 112 - Cherokee Prairies

*Landform:* Hillslope on upland

*Parent material:* Sandy and silty residuum weathered from sandstone over sandy and silty residuum

weathered from sandstone and shale

*Slope:* 3 to 7 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Slowest permeability:* Moderate (About 0.60 in/hr)

*Available water capacity:* Moderate (About 7.4 inches)

*Shrink-swell potential:* Low (About 1.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* Medium

*Ecological site:* Loamy Upland (pe35-42)

*Land capability (nonirrigated):* 4e

**Typical Profile:**

H1—0 to 19 inches; loam

H2—19 to 34 inches; loam

H3—34 to 38 inches; gravelly loam

H4—38 to 42 inches; unweathered bedrock

**Collinsville**

*MLRA:* 112 - Cherokee Prairies

*Landform:* Hillslope on upland

*Parent material:* Loamy residuum weathered from sandstone

*Slope:* 3 to 7 percent

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* Moderately rapid (About 2.00 in/hr)

*Available water capacity:* Very low (About 2.7 inches)

*Shrink-swell potential:* Low (About 1.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* Low

*Ecological site:* Shallow Sandstone (pe35-42)

*Typical Profile:*

H1—0 to 11 inches; loam

H2—11 to 17 inches; loam

R—17 to 21 inches; unweathered bedrock

**Minor Components**

**Dennis**

*Composition:* About 5 percent

*Geomorphic Position:* hillslope on upland

*Slope:* 2 to 6 percent

*Drainage class:* Moderately well drained

*Ecological site:* Loamy Upland (pe35-42)

**Eram**

*Composition:* About 5 percent

*Geomorphic Position:* hillslope on upland

*Slope:* 7 to 12 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Moderately well drained

*Ecological site:* Clay Upland (pe35-42)

**Olpe**

*Composition:* About 5 percent

*Geomorphic Position:* paleoterrace on upland

*Slope:* 1 to 5 percent

*Drainage class:* Well drained

*Ecological site:* Loamy Upland (pe35-42)

**059BH—Bates-Collinsville loams,  
7 to 12 percent slopes**

**Map Unit Composition**

Bates: 50 percent

Collinsville: 35 percent

Minor components: 15 percent

**Component Descriptions**

**Bates**

*MLRA:* 112 - Cherokee Prairies

*Landform:* Hillslope on upland

*Hillslope position:* Backslope

*Parent material:* Sandy and silty residuum weathered from sandstone over sandy and silty residuum

weathered from sandstone and shale

*Slope:* 7 to 8 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Slowest permeability:* Moderate (About 0.60 in/hr)

*Available water capacity:* Moderate (About 6.5 inches)

*Shrink-swell potential:* Low (About 1.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* Medium

*Ecological site:* Loamy Upland (pe35-42)

*Land capability (nonirrigated):* 6s

*Typical Profile:*

H1—0 to 19 inches; loam

H2—19 to 26 inches; loam

H3—26 to 34 inches; gravelly loam

Cr—34 to 38 inches; unweathered bedrock

**Collinsville**

*MLRA:* 112 - Cherokee Prairies

*Landform:* Hillslope on upland

*Hillslope position:* Backslope

*Parent material:* Loamy residuum weathered from sandstone

*Slope:* 7 to 12 percent

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* Moderately rapid (About 2.00 in/hr)

*Available water capacity:* Very low (About 2.7 inches)

*Shrink-swell potential:* Low (About 1.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* Low

*Ecological site:* Shallow Sandstone (pe35-42)

*Land capability (nonirrigated):* 7s

*Typical Profile:*

H1—0 to 11 inches; loam

H2—11 to 17 inches; channery loam

R—17 to 21 inches; unweathered bedrock

**Minor Components**

**Dennis**

*Composition:* About 5 percent

*Geomorphic Position:* hillslope on upland

*Slope:* 2 to 6 percent

*Drainage class:* Moderately well drained

*Ecological site:* Loamy Upland (pe35-42)

**Eram**

*Composition:* About 5 percent

*Geomorphic Position:* hillslope on upland

*Slope:* 7 to 12 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Moderately well drained  
*Ecological site:* Clay Upland (pe35-42)

#### **Olpe**

*Composition:* About 5 percent  
*Geomorphic Position:* paleoterrace on upland  
*Slope:* 1 to 5 percent  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe35-42)

### **059BS—Bolivar-Hector loams, 6 to 12 percent slopes**

#### **Map Unit Composition**

Bolivar: 50 percent  
 Hector: 40 percent  
 Minor components: 10 percent

#### **Component Descriptions**

##### **Bolivar**

*MLRA:* 112 - Cherokee Prairies  
*Landform:* Hillslope on upland  
*Hillslope position:* Backslope  
*Parent material:* Loamy residuum weathered from sandstone  
*Slope:* 6 to 12 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Slowest permeability:* Moderate (About 0.60 in/hr)  
*Available water capacity:* Low (About 5.3 inches)  
*Shrink-swell potential:* Moderate (About 4.5 LEP)  
*Flooding hazard:* None  
*Depth to seasonal water saturation:* More than 6 feet  
*Runoff class:* Medium  
*Ecological site:* Savannah (pe35-42)  
*Land capability (nonirrigated):* 6e

##### *Typical Profile:*

H1—0 to 13 inches; loam  
 H2—13 to 28 inches; sandy clay loam  
 H3—28 to 34 inches; channery sandy clay loam  
 Cr—34 to 38 inches; unweathered bedrock

##### **Hector**

*MLRA:* 112 - Cherokee Prairies  
*Landform:* Hillslope on upland  
*Hillslope position:* Backslope

*Parent material:* Loamy residuum weathered from sandstone  
*Slope:* 6 to 12 percent  
*Depth to restrictive feature:* 10 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* Moderately rapid (About 2.00 in/hr)  
*Available water capacity:* Very low (About 2.2 inches)  
*Shrink-swell potential:* Low (About 1.5 LEP)  
*Flooding hazard:* None  
*Depth to seasonal water saturation:* More than 6 feet  
*Runoff class:* Low  
*Ecological site:* Shallow Savannah (pe35-42)  
*Land capability (nonirrigated):* 7e

##### *Typical Profile:*

H1—0 to 9 inches; loam  
 H2—9 to 18 inches; loam  
 R—18 to 22 inches; unweathered bedrock

#### **Minor Components**

##### **Welda**

*Composition:* About 10 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 2 to 5 percent  
*Drainage class:* Well drained  
*Ecological site:* Savannah (pe35-42)

### **059CM—Clareson-Eram silty clay loams, 3 to 15 percent slopes**

#### **Map Unit Composition**

Clareson: 55 percent  
 Eram: 30 percent  
 Minor components: 15 percent

#### **Component Descriptions**

##### **Clareson**

*MLRA:* 112 - Cherokee Prairies  
*Landform:* Hillslope on upland  
*Hillslope position:* Backslope  
*Parent material:* Silty and clayey residuum weathered from limestone  
*Slope:* 3 to 15 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* Slow (About 0.06 in/hr)  
*Available water capacity:* Low (About 3.2 inches)  
*Shrink-swell potential:* High (About 7.5 LEP)

*Flooding hazard:* None  
*Depth to seasonal water saturation:* More than 6 feet  
*Runoff class:* Very high  
*Ecological site:* Shallow Flats (pe35-42)  
*Land capability (nonirrigated):* 6e

*Typical Profile:*

A—0 to 7 inches; silty clay loam  
 BA—7 to 15 inches; silty clay loam  
 Bt—15 to 26 inches; flaggy silty clay loam  
 R—26 to 30 inches; unweathered bedrock

**Eram**

*MLRA:* 112 - Cherokee Prairies  
*Landform:* Hillslope on upland  
*Hillslope position:* Backslope  
*Parent material:* Silty and clayey residuum weathered from shale  
*Slope:* 3 to 12 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Moderately well drained  
*Slowest permeability:* Slow (About 0.06 in/hr)  
*Available water capacity:* Low (About 5.6 inches)  
*Shrink-swell potential:* High (About 7.5 LEP)  
*Flooding hazard:* None  
*Depth to seasonal water saturation:* About 9 to 14 inches  
*Runoff class:* Very high  
*Ecological site:* Clay Upland (pe35-42)  
*Land capability (nonirrigated):* 6e

*Typical Profile:*

H1—0 to 7 inches; silty clay loam  
 H2—7 to 38 inches; silty clay  
 Cr—38 to 42 inches; weathered bedrock

**Minor Components**

**Bates**

*Composition:* About 10 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 3 to 7 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe35-42)

**Rock outcrop**

*Composition:* About 5 percent  
*Geomorphic Position:* hillslope on upland

**059DN—Dennis-Bates complex, 2 to 6 percent slopes**

**Map Unit Composition**

Dennis: 60 percent  
 Bates: 30 percent  
 Minor components: 10 percent

**Component Descriptions**

**Dennis**

*MLRA:* 112 - Cherokee Prairies  
*Landform:* Hillslope on upland  
*Hillslope position:* Backslope  
*Parent material:* Silty and clayey residuum weathered from shale  
*Slope:* 2 to 6 percent  
*Drainage class:* Moderately well drained  
*Slowest permeability:* Slow (About 0.06 in/hr)  
*Available water capacity:* High (About 10.6 inches)  
*Shrink-swell potential:* High (About 7.5 LEP)  
*Flooding hazard:* None  
*Depth to seasonal water saturation:* About 12 to 18 inches  
*Runoff class:* High  
*Ecological site:* Loamy Upland (pe35-42)  
*Land capability (nonirrigated):* 3e

*Typical Profile:*

H1—0 to 10 inches; silt loam  
 H2—10 to 15 inches; silty clay loam  
 H3—15 to 60 inches; silty clay

**Bates**

*MLRA:* 112 - Cherokee Prairies  
*Landform:* Hillslope on upland  
*Hillslope position:* Backslope  
*Parent material:* Sandy and silty residuum weathered from sandstone over sandy and silty residuum weathered from sandstone and shale  
*Slope:* 2 to 6 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Slowest permeability:* Moderate (About 0.60 in/hr)  
*Available water capacity:* Moderate (About 6.5 inches)  
*Shrink-swell potential:* Low (About 1.5 LEP)  
*Flooding hazard:* None  
*Depth to seasonal water saturation:* More than 6 feet  
*Runoff class:* Low

*Ecological site:* Loamy Upland (pe35-42)  
*Land capability (nonirrigated):* 3e

*Typical Profile:*

H1—0 to 19 inches; loam  
 H2—19 to 26 inches; loam  
 H3—26 to 34 inches; gravelly loam  
 Cr—34 to 38 inches; unweathered bedrock

**Minor Components**

**Eram**

*Composition:* About 5 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 7 to 12 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Moderately well drained  
*Ecological site:* Clay Upland (pe35-42)

**Osage**

*Composition:* About 5 percent  
*Slope:* 0 to 1 percent  
*Drainage class:* Poorly drained  
*Ecological site:* Clay Lowland (pe35-42)

**059EA—Eram-Lebo silty clay loams, 7 to 12 percent slopes**  
**Map Unit Composition**

Eram: 55 percent  
 Lebo: 35 percent  
 Minor components: 10 percent

**Component Descriptions**

**Eram**

*MLRA:* 112 - Cherokee Prairies  
*Landform:* Hillslope on upland  
*Hillslope position:* Backslope  
*Parent material:* Silty and clayey residuum weathered from shale  
*Slope:* 7 to 12 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Moderately well drained  
*Slowest permeability:* Slow (About 0.06 in/hr)  
*Available water capacity:* Low (About 5.6 inches)  
*Shrink-swell potential:* High (About 7.5 LEP)  
*Flooding hazard:* None  
*Depth to seasonal water saturation:* About 9 to 14 inches  
*Runoff class:* Very high  
*Ecological site:* Clay Upland (pe35-42)  
*Land capability (nonirrigated):* 6e

*Typical Profile:*

H1—0 to 7 inches; silty clay loam

H2—7 to 38 inches; silty clay  
 Cr—38 to 42 inches; weathered bedrock

**Lebo**

*MLRA:* 112 - Cherokee Prairies  
*Landform:* Hillslope on upland  
*Hillslope position:* Backslope  
*Parent material:* Loamy residuum weathered from sandstone and shale  
*Slope:* 8 to 12 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Slowest permeability:* Moderate (About 0.60 in/hr)  
*Available water capacity:* Low (About 5.5 inches)  
*Shrink-swell potential:* Moderate (About 4.5 LEP)  
*Flooding hazard:* None  
*Depth to seasonal water saturation:* More than 6 feet  
*Runoff class:* Medium  
*Ecological site:* Loamy Upland (pe35-42)  
*Land capability (nonirrigated):* 6e

*Typical Profile:*

H1—0 to 14 inches; silty clay loam  
 H2—14 to 28 inches; very channery silty clay loam  
 Cr—28 to 36 inches; weathered bedrock

**Minor Components**

**Clareson**

*Composition:* About 5 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 3 to 15 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Ecological site:* Shallow Flats (pe35-42)

**Dennis**

*Composition:* About 5 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 2 to 6 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Loamy Upland (pe35-42)

**059EC—Eram-Lula complex, 3 to 7 percent slopes**

**Map Unit Composition**

Eram: 60 percent  
 Lula: 25 percent  
 Minor components: 15 percent

## Component Descriptions

### Eram

*MLRA:* 112 - Cherokee Prairies

*Landform:* Hillslope on upland

*Hillslope position:* Backslope

*Parent material:* Silty and clayey residuum weathered from shale

*Slope:* 3 to 7 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Moderately well drained

*Slowest permeability:* Slow (About 0.06 in/hr)

*Available water capacity:* Low (About 5.6 inches)

*Shrink-swell potential:* High (About 7.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* About 9 to 14 inches

*Runoff class:* High

*Ecological site:* Clay Upland (pe35-42)

*Land capability (nonirrigated):* 4e

#### Typical Profile:

H1—0 to 7 inches; silty clay loam

H2—7 to 38 inches; silty clay

Cr—38 to 42 inches; weathered bedrock

### Lula

*MLRA:* 112 - Cherokee Prairies

*Landform:* Hillslope on upland

*Hillslope position:* Summit, backslope

*Parent material:* Fine-silty residuum weathered from limestone

*Slope:* 3 to 5 percent

*Depth to restrictive feature:* 40 to 60 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* Moderate (About 0.60 in/hr)

*Available water capacity:* Moderate (About 7.9 inches)

*Shrink-swell potential:* High (About 7.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* High

*Ecological site:* Loamy Upland (pe35-42)

*Land capability (nonirrigated):* 3e

#### Typical Profile:

H1—0 to 7 inches; silt loam

H2—7 to 12 inches; silty clay loam

H3—12 to 44 inches; silty clay loam

R—44 to 52 inches; unweathered bedrock

## Minor Components

### Bates

*Composition:* About 5 percent

*Geomorphic Position:* hillslope on upland

*Slope:* 3 to 7 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Ecological site:* Loamy Upland (pe35-42)

### Kenoma

*Composition:* About 5 percent

*Geomorphic Position:* hillslope on upland

*Slope:* 1 to 4 percent

*Drainage class:* Moderately well drained

*Ecological site:* Clay Upland (pe35-42)

### Olpe

*Composition:* About 5 percent

*Geomorphic Position:* paleoterrace on upland

*Slope:* 1 to 5 percent

*Drainage class:* Well drained

*Ecological site:* Loamy Upland (pe35-42)

## 059LN—Lebo-Rock outcrop complex, 20 to 40 percent slopes

## Map Unit Composition

Lebo: 75 percent

Rock outcrop: 15 percent

Minor components: 10 percent

## Component Descriptions

### Lebo

*MLRA:* 112 - Cherokee Prairies

*Landform:* Hillslope on upland

*Hillslope position:* Backslope

*Parent material:* Residuum weathered from shale-sandstone

*Slope:* 20 to 40 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Slowest permeability:* Moderate (About 0.60 in/hr)

*Available water capacity:* Low (About 3.4 inches)

*Shrink-swell potential:* Moderate (About 4.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* High

*Ecological site:* Loamy Upland (pe35-42)

*Land capability (nonirrigated):* 7e

#### Typical Profile:

H1—0 to 7 inches; stony silty clay loam  
 H2—7 to 14 inches; channery silty clay loam  
 H3—14 to 28 inches; very channery silty clay loam  
 Cr—28 to 36 inches; weathered bedrock

**Rock outcrop**

*MLRA:* 112 - Cherokee Prairies

*Landform:* Ridge on upland

*Hillslope position:* Summit

*Parent material:* Limestone

*Drainage class:* Well drained

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* Very high

*Land capability (nonirrigated):* 8e

**Minor Components****Clareson**

*Composition:* About 10 percent

*Geomorphic Position:* hillslope on upland

*Slope:* 3 to 15 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Well drained

*Ecological site:* Shallow Flats (pe35-42)

**059MB—Mason silt loam, 0 to 2 percent slopes, rarely flooded****Map Unit Composition**

Mason: 90 percent

Minor components: 10 percent

**Component Descriptions****Mason**

*MLRA:* 112 - Cherokee Prairies

*Landform:* Stream terrace on river valley

*Parent material:* Fine-silty alluvium

*Slope:* 0 to 1 percent

*Drainage class:* Well drained

*Slowest permeability:* Moderately slow (About 0.20 in/hr)

*Available water capacity:* High (About 10.6 inches)

*Shrink-swell potential:* Moderate (About 4.5 LEP)

*Flooding hazard:* Rare

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* Low

*Ecological site:* Loamy Lowland (pe35-42)

*Land capability (nonirrigated):* 1

**Typical Profile:**

H1—0 to 7 inches; silt loam

H2—7 to 60 inches; silty clay loam

**Minor Components****Welda**

*Composition:* About 5 percent

*Geomorphic Position:* hillslope on upland

*Slope:* 2 to 5 percent

*Drainage class:* Well drained

*Ecological site:* Savannah (pe35-42)

**Osage**

*Composition:* About 5 percent

*Slope:* 0 to 2 percent

*Drainage class:* Poorly drained

*Ecological site:* Loamy Lowland (pe35-42)

**059OS—Osage silty clay loam, 0 to 2 percent slopes, occasionally flooded****Map Unit Composition**

Osage: 85 percent

Minor components: 15 percent

**Component Descriptions****Osage**

*MLRA:* 112 - Cherokee Prairies

*Landform:* Flood plain on river valley

*Parent material:* Clayey alluvium

*Slope:* 0 to 2 percent

*Drainage class:* Poorly drained

*Slowest permeability:* Very slow (About 0.00 in/hr)

*Available water capacity:* Moderate (About 7.6 inches)

*Shrink-swell potential:* Very high (About 17.0 LEP)

*Flooding hazard:* Occasional

*Depth to seasonal water saturation:* About 0 to 12 inches

*Runoff class:* High

*Ecological site:* Loamy Lowland (pe35-42)

*Land capability (nonirrigated):* 2w

**Typical Profile:**

H1—0 to 14 inches; silty clay loam

H2—14 to 60 inches; silty clay

**Minor Components****Mason**

*Composition:* About 5 percent

*Slope:* 0 to 1 percent



*Drainage class:* Well drained  
*Ecological site:* Loamy Lowland (pe35-42)

#### **Leanna**

*Phase:* Drained  
*Composition:* About 5 percent  
*Slope:* 0 to 2 percent  
*Drainage class:* Somewhat poorly drained  
*Ecological site:* Loamy Lowland (pe35-42)

#### **Verdigris**

*Composition:* About 5 percent  
*Slope:* 0 to 2 percent  
*Drainage class:* Well drained  
*Ecological site:* Loamy Lowland (pe35-42)

### **059VB—Verdigris silt loam, 0 to 2 percent slopes, occasionally flooded**

#### **Map Unit Composition**

Verdigris: 85 percent  
 Minor components: 15 percent

#### **Component Descriptions**

##### **Verdigris**

*MLRA:* 112 - Cherokee Prairies  
*Landform:* Flood plain on river valley  
*Parent material:* Fine-silty alluvium  
*Slope:* 0 to 2 percent  
*Drainage class:* Well drained  
*Slowest permeability:* Moderate (About 0.60 in/hr)  
*Available water capacity:* Very high (About 12.1 inches)  
*Shrink-swell potential:* Moderate (About 4.5 LEP)  
*Flooding hazard:* Occasional  
*Depth to seasonal water saturation:* More than 6 feet  
*Runoff class:* Low  
*Ecological site:* Loamy Lowland (pe35-42)  
*Land capability (nonirrigated):* 2w

##### *Typical Profile:*

H1—0 to 16 inches; silt loam  
 H2—16 to 60 inches; silt loam

#### **Minor Components**

##### **Mason**

*Composition:* About 5 percent  
*Slope:* 0 to 1 percent  
*Drainage class:* Well drained  
*Ecological site:* Loamy Lowland (pe35-42)

#### **Osage**

*Composition:* About 5 percent  
*Slope:* 0 to 2 percent  
*Drainage class:* Poorly drained  
*Ecological site:* Loamy Lowland (pe35-42)

#### **Leanna**

*Phase:* Drained  
*Composition:* About 5 percent  
*Slope:* 0 to 2 percent  
*Drainage class:* Somewhat poorly drained  
*Ecological site:* Loamy Lowland (pe35-42)

### **087EC—Eudora-Bismarckgrove complex, 0 to 3 percent slopes, overwash, occasionally flooded**

*Mapunit Information:* The map unit does meet the criteria for prime farmland.

#### **Map Unit Composition**

Eudora: 65 percent  
 Bismarckgrove: 20 percent  
 Minor components: 15 percent

#### **Component Descriptions**

##### **Eudora**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills  
*Landform:* Flood-plain step on river valley  
*Parent material:* Coarse-silty alluvium  
*Slope:* 0 to 3 percent  
*Drainage class:* Well drained  
*Slowest permeability:* Moderate (About 0.60 in/hr)  
*Available water capacity:* High (About 11.9 inches)  
*Shrink-swell potential:* Low (About 1.5 LEP)  
*Flooding hazard:* Occasional  
*Depth to seasonal water saturation:* More than 6 feet  
*Runoff class:* Low  
*Ecological site:* Loamy Lowland (pe30-37)  
*Land capability (nonirrigated):* 2w

##### *Typical Profile:*

Ap—0 to 6 inches; fine sandy loam  
 A—6 to 12 inches; silt loam  
 AC—12 to 18 inches; silt loam  
 C1—18 to 25 inches; silt loam  
 C2—25 to 44 inches; silt loam  
 C3—44 to 60 inches; silt loam

##### **Bismarckgrove**

**MLRA:** 106 - Nebraska and Kansas Loess-Drift Hills

**Landform:** Flood-plain step on river valley

**Parent material:** Fine-silty alluvium

**Slope:** 0 to 3 percent

**Drainage class:** Well drained

**Slowest permeability:** Moderate (About 0.60 in/hr)

**Available water capacity:** High (About 10.4 inches)

**Shrink-swell potential:** Moderate (About 4.5 LEP)

**Flooding hazard:** Occasional

**Depth to seasonal water saturation:** More than 6 feet

**Runoff class:** Low

**Ecological site:** Loamy Lowland (pe30-37)

**Land capability (nonirrigated):** 2w

**Typical Profile:**

Ap—0 to 7 inches; fine sandy loam

A—7 to 33 inches; silty clay loam

Bw—33 to 52 inches; silt loam

C—52 to 80 inches; loamy very fine sand

**Component note:** The Bismarckgrove series was formerly mapped as Muir in the Pottawatomie and Shawnee County Soil Surveys. The Bismarckgrove series is very deep and have moderate permeability.

**Minor Components**

**Kimo**

**Composition:** About 5 percent

**Slope:** 0 to 1 percent

**Drainage class:** Somewhat poorly drained

**Ecological site:** Clay Lowland (pe30-37)

**Stonehouse**

**Composition:** About 5 percent

**Slope:** 0 to 3 percent

**Drainage class:** Excessively drained

**Bourbonais**

**Composition:** About 5 percent

**Slope:** 0 to 3 percent

**Drainage class:** Somewhat excessively drained

**Ecological site:** Clay Lowland (pe30-37)

**General Considerations:** Most areas of these soils are cultivated. These soils are suited to all major crops commonly grown in the valley. These soils have good potential for hay or tame grasses. Flooding limits the suitability of these soils for many engineering uses. The land capability classification is Ilw.

**087FU—Fluvaquents**

**Mapunit Information:** The map unit does not meet the criteria for prime farmland.

**Map Unit Composition**

Fluvaquents: 100 percent

**Component Descriptions**

**Fluvaquents**

**MLRA:** 106 - Nebraska and Kansas Loess-Drift Hills

**Landform:** Flood plain on valley

**Parent material:** Coarse-silty alluvium

**Slope:** 0 to 5 percent

**Drainage class:** Moderately well drained

**Slowest permeability:** Moderate (About 0.60 in/hr)

**Available water capacity:** High (About 11.7 inches)

**Shrink-swell potential:** Low (About 1.5 LEP)

**Flooding hazard:** Frequent

**Depth to seasonal water saturation:** About 18 to 36 inches

**Runoff class:** Low

**Land capability (nonirrigated):** 5w

**Typical Profile:**

A—0 to 7 inches; silt loam

C1—7 to 35 inches; silt loam

C2—35 to 60 inches; stratified sandy loam to silt loam

**087MU—Muscotah silty clay loam, 0 to 1 percent slopes, very rarely flooded**

**Mapunit Information:** The map unit does meet the criteria for prime farmland.

**Map Unit Composition**

Muscotah: 85 percent

Minor components: 15 percent

**Component Descriptions**

**Muscotah**

**MLRA:** 106 - Nebraska and Kansas Loess-Drift Hills

**Landform:** Terrace on river valley

**Parent material:** Clayey alluvium

**Slope:** 0 to 1 percent

**Drainage class:** Somewhat poorly drained

*Slowest permeability:* Very slow (About 0.00 in/hr)  
*Available water capacity:* High (About 9.3 inches)  
*Shrink-swell potential:* High (About 7.5 LEP)  
*Flooding hazard:* Very Rare  
*Depth to seasonal water saturation:* About 18 to 36 inches  
*Runoff class:* Very high  
*Land capability (irrigated):* 2w  
*Land capability (nonirrigated):* 2w

*Typical Profile:*

Ap—0 to 6 inches; silty clay loam  
 A—6 to 11 inches; silty clay loam  
 Bw—11 to 24 inches; silty clay  
 Bg1—24 to 47 inches; silty clay  
 Bg2—47 to 60 inches; silty clay

**Minor Components**

**Reading**

*Composition:* About 5 percent  
*Slope:* 0 to 2 percent  
*Drainage class:* Moderately well drained

**Wabash**

*Composition:* About 5 percent  
*Slope:* 0 to 2 percent  
*Drainage class:* Poorly drained

**Rossville**

*Composition:* About 5 percent  
*Slope:* 0 to 2 percent  
*Drainage class:* Well drained  
*Ecological site:* Loamy Lowland (pe30-37)

Unspecified

*General Considerations:* Most areas of this soil are cultivated. This soil is suited to all major crops commonly grown in the valley. This soil has good potential for hay or tame grasses. Flooding and ponding limits the suitability of this soil for many engineering uses. The land capability classification is Ilw.

**091EB—Eudora Soils, overwash, rarely flooded**

**Map Unit Composition**

Eudora: 85 percent  
 Minor components: 15 percent

**Component Descriptions**

**Eudora**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills  
*Landform:* Flood-plain step on river valley  
*Parent material:* Coarse-silty alluvium  
*Slope:* 0 to 2 percent  
*Drainage class:* Well drained  
*Slowest permeability:* Moderate (About 0.60 in/hr)  
*Available water capacity:* Very high (About 12.1 inches)  
*Shrink-swell potential:* Low (About 1.5 LEP)  
*Flooding hazard:* Rare  
*Depth to seasonal water saturation:* More than 6 feet  
*Runoff class:* Low  
*Ecological site:* Loamy Lowland (pe30-37)  
*Land capability (nonirrigated):* 1

*Typical Profile:*

H1—0 to 13 inches; silt loam  
 H2—13 to 60 inches; very fine sandy loam

**Minor Components**

**Kimo**

*Composition:* About 15 percent  
*Slope:* 0 to 1 percent  
*Drainage class:* Poorly drained  
*Ecological site:* Clay Lowland (pe30-37)

**091MC—Morrill loam, 3 to 8 percent slopes**

**Map Unit Composition**

Morrill: 85 percent  
 Minor components: 15 percent

**Component Descriptions**

**Morrill**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills  
*Landform:* Hillslope on upland  
*Parent material:* Fine-loamy glaciofluvial deposits  
*Slope:* 3 to 8 percent  
*Drainage class:* Well drained  
*Slowest permeability:* Moderately slow (About 0.20 in/hr)  
*Available water capacity:* High (About 10.2 inches)  
*Shrink-swell potential:* Moderate (About 4.5 LEP)

*Flooding hazard:* None  
*Depth to seasonal water saturation:* More than 6 feet  
*Runoff class:* Medium  
*Ecological site:* Loamy Upland (pe30-37)  
*Land capability (nonirrigated):* 3e

*Typical Profile:*

H1—0 to 13 inches; loam  
 H2—13 to 22 inches; clay loam  
 H3—22 to 60 inches; clay loam

**Minor Components**

**Grundy**

*Composition:* About 8 percent  
*Slope:* 1 to 3 percent  
*Drainage class:* Somewhat poorly drained  
*Ecological site:* Clay Upland (pe30-37)

**Ladoga**

*Composition:* About 7 percent  
*Slope:* 3 to 8 percent  
*Drainage class:* Moderately well drained

**139CM—Clareson-Eram complex,  
3 to 15 percent slopes**

**Map Unit Composition**

Clareson: 55 percent  
 Eram: 30 percent  
 Minor components: 15 percent

**Component Descriptions**

**Clareson**

*MLRA:* 112 - Cherokee Prairies  
*Landform:* Hillslope on upland  
*Parent material:* Silty and clayey residuum weathered from limestone  
*Slope:* 3 to 15 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* Slow (About 0.06 in/hr)  
*Available water capacity:* Low (About 3.2 inches)  
*Shrink-swell potential:* High (About 7.5 LEP)  
*Flooding hazard:* None  
*Depth to seasonal water saturation:* More than 6 feet  
*Runoff class:* Very high  
*Ecological site:* Shallow Flats (pe35-42)  
*Land capability (nonirrigated):* 6e

*Typical Profile:*

A—0 to 8 inches; silty clay loam  
 AB—8 to 16 inches; silty clay loam  
 Bt—16 to 24 inches; very flaggy silty clay loam  
 R—24 to 32 inches; unweathered bedrock

**Eram**

*MLRA:* 112 - Cherokee Prairies  
*Landform:* Hillslope on upland  
*Hillslope position:* Backslope  
*Parent material:* Silty and clayey residuum weathered from shale  
*Slope:* 3 to 12 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Moderately well drained  
*Slowest permeability:* Slow (About 0.06 in/hr)  
*Available water capacity:* Low (About 4.3 inches)  
*Shrink-swell potential:* High (About 7.5 LEP)  
*Flooding hazard:* None  
*Depth to seasonal water saturation:* About 9 to 14 inches  
*Runoff class:* Very high  
*Ecological site:* Clay Upland (pe35-42)  
*Land capability (nonirrigated):* 6e

*Typical Profile:*

Ap—0 to 9 inches; silty clay loam  
 Bt—9 to 28 inches; silty clay  
 Cr—28 to 32 inches; weathered bedrock

**Minor Components**

**Rock outcrop**

*Composition:* About 10 percent

**Bates**

*Composition:* About 5 percent  
*Slope:* 3 to 7 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe35-42)

**139ED—Elmont loam, 3 to 7 percent slopes**

**Map Unit Composition**

Elmont: 85 percent  
 Minor components: 15 percent

**Component Descriptions**

**Elmont**

*MLRA:* 112 - Cherokee Prairies  
*Landform:* Hillslope on upland

*Parent material:* Silty and clayey residuum weathered from shale and siltstone  
*Slope:* 3 to 7 percent  
*Depth to restrictive feature:* 40 to 60 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Slowest permeability:* Moderately slow (About 0.20 in/hr)  
*Available water capacity:* High (About 10.3 inches)  
*Shrink-swell potential:* Moderate (About 4.5 LEP)  
*Flooding hazard:* None  
*Depth to seasonal water saturation:* More than 6 feet  
*Runoff class:* Medium  
*Ecological site:* Loamy Upland (pe35-42)  
*Land capability (nonirrigated):* 3e

*Typical Profile:*

A—0 to 8 inches; loam  
 AB—8 to 16 inches; loam  
 Bt—16 to 42 inches; clay loam  
 BC—42 to 52 inches; clay loam  
 Cr—52 to 60 inches; unweathered bedrock

**Minor Components**

**Eram**

*Composition:* About 10 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 3 to 12 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Moderately well drained  
*Ecological site:* Clay Upland (pe35-42)

**Kenoma**

*Composition:* About 5 percent  
*Slope:* 1 to 4 percent  
*Depth to restrictive feature:* 40 to 60 inches to bedrock (lithic)  
*Drainage class:* Moderately well drained  
*Ecological site:* Clay Upland (pe35-42)

**139LU—Lula silt loam, 1 to 3 percent slopes**

**Map Unit Composition**

Lula: 85 percent  
 Minor components: 15 percent

**Component Descriptions**

**Lula**

MLRA: 112 - Cherokee Prairies

*Landform:* Hillslope on upland  
*Hillslope position:* Summit  
*Parent material:* Residuum weathered from limestone  
*Slope:* 1 to 3 percent  
*Depth to restrictive feature:* 40 to 60 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Slowest permeability:* Moderate (About 0.60 in/hr)  
*Available water capacity:* Moderate (About 7.9 inches)  
*Shrink-swell potential:* Moderate (About 4.5 LEP)  
*Flooding hazard:* None  
*Depth to seasonal water saturation:* More than 6 feet  
*Runoff class:* High  
*Ecological site:* Loamy Upland (pe35-42)  
*Land capability (nonirrigated):* 2e

*Typical Profile:*

A—0 to 8 inches; silt loam  
 AB—8 to 14 inches; silty clay loam  
 Bt—14 to 44 inches; silty clay loam  
 R—44 to 52 inches; unweathered bedrock

**Minor Components**

**Eram**

*Composition:* About 5 percent  
*Slope:* 3 to 7 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Moderately well drained  
*Ecological site:* Clay Upland (pe35-42)

**Kenoma**

*Composition:* About 5 percent  
*Slope:* 1 to 4 percent  
*Depth to restrictive feature:* 40 to 60 inches to bedrock (lithic)  
*Drainage class:* Moderately well drained  
*Ecological site:* Clay Upland (pe35-42)

**Dwight**

*Composition:* About 5 percent  
*Slope:* 0 to 3 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Clay Pan (pe35-42)

**177MF—Martin silty clay loam, 7 to 11 percent slopes**

**Map Unit Composition**

Martin: 90 percent

Minor components: 10 percent

### Component Descriptions

#### Martin

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills

*Landform:* Hillslope on upland

*Parent material:* Silty and clayey colluvium derived from limestone and shale over silty and clayey residuum weathered from limestone and shale

*Slope:* 7 to 11 percent

*Drainage class:* Moderately well drained

*Slowest permeability:* Slow (About 0.06 in/hr)

*Available water capacity:* High (About 9.9 inches)

*Shrink-swell potential:* High (About 7.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* About 21 to 26 inches

*Runoff class:* Very high

*Ecological site:* Loamy Upland (pe35-42)

*Land capability (nonirrigated):* 4e

#### Typical Profile:

H1—0 to 12 inches; silty clay loam

H2—12 to 17 inches; silty clay loam

H3—17 to 60 inches; silty clay

### Minor Components

#### Elmont

*Composition:* About 5 percent

*Slope:* 7 to 11 percent

*Depth to restrictive feature:* 40 to 60 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Ecological site:* Limy Upland (pe35-42)

#### Martin

*Composition:* About 5 percent

*Slope:* 7 to 11 percent

*Drainage class:* Moderately well drained

*Ecological site:* Limy Upland (pe35-42)

## 177SW—Vinland-Rock outcrop complex, 15 to 45 percent slopes

### Map Unit Composition

Rock outcrop: 60 percent

Vinland: 26 percent

Minor components: 14 percent

### Component Descriptions

#### Rock outcrop

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills

*Landform:* Hillslope on upland

*Slope:* 15 to 45 percent

*Drainage class:* Excessively drained

*Flooding hazard:* None

*Depth to seasonal water saturation:* More than 6 feet

*Land capability (nonirrigated):* 8

#### Vinland

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills

*Landform:* Hillslope on upland

*Parent material:* Sandy and silty residuum weathered from shale

*Slope:* 15 to 30 percent

*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* Moderate (About 0.60 in/hr)

*Available water capacity:* Low (About 3.7 inches)

*Shrink-swell potential:* Moderate (About 4.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* Medium

*Ecological site:* Loamy Upland (pe30-37)

*Land capability (nonirrigated):* 6e

#### Typical Profile:

H1—0 to 11 inches; silty clay loam

H2—11 to 17 inches; silty clay loam

Cr—17 to 20 inches; weathered bedrock

### Minor Components

#### Sogn

*Composition:* About 10 percent

*Slope:* 15 to 20 percent

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Somewhat excessively drained

*Ecological site:* Shallow Limy (pe30-37)

#### Martin

*Composition:* About 2 percent

*Slope:* 7 to 11 percent

*Drainage class:* Moderately well drained

*Ecological site:* Loamy Upland (pe35-42)

#### Labette

*Composition:* About 2 percent

*Slope:* 3 to 6 percent

*Depth to restrictive feature:* 20 to 40 inches  
to bedrock (lithic)  
*Drainage class:* Well drained  
*Ecological site:* Limy Upland (pe35-42)

### **601KW—Konawa fine sandy loam, 8 to 20 percent slopes**

#### **Map Unit Composition**

Konawa: 90 percent  
Minor components: 10 percent

#### **Component Descriptions**

##### **Konawa**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills

*Landform:* Hillslope on upland

*Parent material:* Fine-loamy glaciofluvial deposits

*Slope:* 8 to 20 percent

*Drainage class:* Well drained

*Slowest permeability:* Moderate (About 0.60 in/hr)

*Available water capacity:* Moderate (About 8.6 inches)

*Shrink-swell potential:* Moderate (About 4.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* Medium

*Ecological site:* Savannah (pe30-37)

*Land capability (nonirrigated):* 6e

##### *Typical Profile:*

H1—0 to 19 inches; fine sandy loam

H2—19 to 47 inches; clay loam

H3—47 to 60 inches; clay loam

##### **Minor Components**

##### **Gymer**

*Composition:* About 5 percent

*Slope:* 3 to 7 percent

*Drainage class:* Well drained

*Ecological site:* Loamy Upland (pe30-37)

##### **Welda**

*Composition:* About 5 percent

*Slope:* 4 to 9 percent

*Drainage class:* Well drained

*Ecological site:* Savannah (pe30-37)

### **601SA—Sarpy-Haynie complex, 0 to 3 percent slopes, occasionally flooded**

#### **Map Unit Composition**

Sarpy: 55 percent  
Haynie: 35 percent  
Minor components: 10 percent

#### **Component Descriptions**

##### **Sarpy**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills

*Landform:* Flood plain on river valley

*Parent material:* Sandy alluvium

*Slope:* 0 to 3 percent

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* Rapid (About 5.95 in/hr)

*Available water capacity:* Low (About 4.1 inches)

*Shrink-swell potential:* Low (About 1.5 LEP)

*Flooding hazard:* Occasional

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* Negligible

*Ecological site:* Sandy Lowland (pe35-37)

*Land capability (nonirrigated):* 3w

##### *Typical Profile:*

H1—0 to 9 inches; loamy fine sand

H2—9 to 60 inches; fine sand

##### **Haynie**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills

*Landform:* Flood plain on river valley

*Parent material:* Coarse-silty alluvium

*Slope:* 0 to 3 percent

*Drainage class:* Well drained

*Slowest permeability:* Moderate (About 0.60 in/hr)

*Available water capacity:* High (About 10.9 inches)

*Shrink-swell potential:* Low (About 1.5 LEP)

*Flooding hazard:* Occasional

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* Very low

*Ecological site:* Loamy Lowland (pe35-37)

*Land capability (nonirrigated):* 2w

##### *Typical Profile:*

H1—0 to 8 inches; very fine sandy loam

H2—8 to 60 inches; very fine sandy loam

**Minor Components****Unnamed Soil**

*Composition:* About 10 percent  
*Slope:* 0 to 2 percent  
*Drainage class:* Somewhat excessively drained  
*Ecological site:* Clay Lowland (pe30-37)

**2326—Kenoma silt loam, 1 to 4 percent slopes****Map Unit Composition**

Kenoma: 90 percent  
 Minor components: 10 percent

**Component Descriptions****Kenoma**

*MLRA:* 112 - Cherokee Prairies  
*Landform:* Hillslope on upland  
*Hillslope position:* Backslope  
*Parent material:* Silty and clayey sediments  
*Slope:* 1 to 4 percent  
*Drainage class:* Moderately well drained  
*Slowest permeability:* Very slow (About 0.00 in/hr)  
*Available water capacity:* Moderate (About 8.7 inches)  
*Shrink-swell potential:* High (About 7.5 LEP)  
*Flooding hazard:* None  
*Depth to seasonal water saturation:* About 9 to 14 inches  
*Runoff class:* Very high  
*Ecological site:* Clay Upland (pe35-42)  
*Land capability (nonirrigated):* 3e

*Typical Profile:*

Ap—0 to 4 inches; silt loam  
 A—4 to 10 inches; silt loam  
 Bt1—10 to 18 inches; silty clay  
 Bt2—18 to 27 inches; silty clay  
 Bt3—27 to 41 inches; silty clay  
 Bt4—41 to 59 inches; silty clay  
 Bt5—59 to 73 inches; silty clay loam

*Component note:* The Kenoma soils are very deep and have very slow permeability. In some areas the soil is 40 to 60 inches to shale or limestone bedrock. Some places the dark surface soil is less than 7 inches thick. Also, included are some areas that have slopes from 5 to 7 percent.

**Minor Components****Woodson**

*Composition:* About 5 percent

*Geomorphic Position:* hillslope on upland  
*Slope:* 1 to 4 percent  
*Drainage class:* Somewhat poorly drained  
*Ecological site:* Clay Upland (pe35-42)

**Eram**

*Composition:* About 5 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 1 to 4 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Moderately well drained  
*Ecological site:* Clay Upland (pe35-42)

*General Considerations:* Most areas of this soil is used for cultivated crops and pasture. It is suited to most crops grown in the watershed. Erosion is a serious hazard that can be controlled by contour farming, terraces, or conservation tillage. This soil is well suited to tame grass pasture. The wetness limits the suitability of this soil for engineering uses. The land capability classification is IIIe.

**2540—Leanna silt loam, 0 to 2 percent slopes, occasionally flooded****Map Unit Composition**

Leanna: 85 percent  
 Minor components: 15 percent

**Component Descriptions****Leanna**

*MLRA:* 112 - Cherokee Prairies  
*Landform:* Flood plain on valley  
*Hillslope position:* Toeslope  
*Parent material:* Silty and clayey alluvium  
*Slope:* 0 to 2 percent  
*Drainage class:* Somewhat poorly drained  
*Slowest permeability:* Very slow (About 0.00 in/hr)  
*Available water capacity:* High (About 10.6 inches)  
*Shrink-swell potential:* High (About 7.5 LEP)  
*Flooding hazard:* Occasional  
*Depth to seasonal water saturation:* About 4 to 9 inches  
*Runoff class:* Low  
*Ecological site:* Clay Lowland (pe35-42)  
*Land capability (nonirrigated):* 2w

*Typical Profile:*

Ap—0 to 10 inches; silt loam



E—10 to 22 inches; silt loam  
 Bt—22 to 40 inches; silty clay  
 BC—40 to 55 inches; silty clay  
 C—55 to 78 inches; silty clay

**Component note:** The Leanna soils are very deep and have very slow permeability. Shrink-swell potential is high. In some areas the soils are moderately well drained. In some places the dark surface soil is less than 7 inches thick. Also, included are some areas that have slopes from 3 to 5 percent.

### Minor Components

#### Mason

*Composition:* About 5 percent  
*Slope:* 0 to 2 percent  
*Drainage class:* Well drained  
*Ecological site:* Loamy Lowland (pe35-42)

#### Verdigris

*Composition:* About 5 percent  
*Slope:* 0 to 2 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Loamy Lowland (pe35-42)

#### Osage

*Composition:* About 5 percent  
*Slope:* 0 to 2 percent  
*Drainage class:* Somewhat poorly drained  
*Ecological site:* Clay Lowland (pe35-42)

**General Considerations:** Most areas of this soil are cultivated. Some areas are pasture or trees. It is suited to all crops grown in the watershed. Erosion is a serious hazard that can be controlled by conservation tillage or no-till. This soil is well suited for hay land and pasture. Flooding and wetness limits the suitability of this soil for many engineering uses. The land capability classification is IIIw.

## 2797—Morrill-gravelly loam, 4 to 20 percent slopes, stony

### Map Unit Composition

Morrill: 85 percent  
 Minor components: 15 percent

### Component Descriptions

#### Morrill

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills  
*Landform:* Hillslope on upland

*Parent material:* Fine-loamy glaciofluvial deposits

*Slope:* 4 to 20 percent

*Drainage class:* Well drained

*Slowest permeability:* Moderately slow (About 0.20 in/hr)

*Available water capacity:* High (About 9.7 inches)

*Shrink-swell potential:* Moderate (About 4.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* High

*Ecological site:* Loamy Upland (pe30-37)

*Land capability (nonirrigated):* 6e

#### Typical Profile:

H1—0 to 10 inches; gravelly loam  
 H2—10 to 15 inches; gravelly clay loam  
 H3—15 to 42 inches; gravelly clay loam  
 H4—42 to 60 inches; gravelly sandy clay loam

### Minor Components

#### Sogn

*Composition:* About 10 percent  
*Slope:* 3 to 20 percent  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Somewhat excessively drained  
*Ecological site:* Shallow Limy (pe35-42)

#### Pawnee

*Composition:* About 5 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 7 to 11 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Clay Upland (pe30-37)

## 3460—Sibleyville-Vinland complex, 7 to 15 percent slopes

### Map Unit Composition

Sibleyville: 50 percent  
 Vinland: 35 percent  
 Minor components: 15 percent

### Component Descriptions

#### Sibleyville

*MLRA:* 112 - Cherokee Prairies  
*Landform:* Hillslope on upland  
*Hillslope position:* Backslope

*Parent material:* Loamy residuum weathered from sandstone  
*Slope:* 7 to 15 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Slowest permeability:* Moderate (About 0.60 in/hr)  
*Available water capacity:* Low (About 4.5 inches)  
*Shrink-swell potential:* Low (About 1.5 LEP)  
*Flooding hazard:* None  
*Depth to seasonal water saturation:* More than 6 feet  
*Runoff class:* Medium  
*Ecological site:* Loamy Upland (pe35-42)  
*Land capability (nonirrigated):* 6e

*Typical Profile:*

A—0 to 7 inches; loam  
 Bt—7 to 15 inches; loam  
 C—15 to 27 inches; channery loam  
 Cr—27 to 31 inches; weathered bedrock

*Component note:* The Sibleyville soils are moderately deep and have moderate permeability. Shrink-swell potential is low. Included are areas that soils range from 40 to 60 inches. In some places soils have a thicker subsoil with more clay. Also, included are some areas that have slopes from 16 to 20 percent.

**Vinland**

*MLRA:* 112 - Cherokee Prairies  
*Landform:* Hillslope on upland  
*Hillslope position:* Backslope  
*Parent material:* Loamy residuum weathered from shale and siltstone  
*Slope:* 7 to 15 percent  
*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)  
*Drainage class:* Somewhat excessively drained  
*Slowest permeability:* Moderate (About 0.60 in/hr)  
*Available water capacity:* Low (About 3.4 inches)  
*Shrink-swell potential:* Low (About 1.5 LEP)  
*Flooding hazard:* None  
*Depth to seasonal water saturation:* More than 6 feet  
*Runoff class:* Medium  
*Ecological site:* Loamy Upland (pe35-42)  
*Land capability (nonirrigated):* 6e

*Typical Profile:*

A—0 to 7 inches; loam  
 Bw—7 to 10 inches; silty clay loam  
 C—10 to 17 inches; silty clay loam  
 Cr—17 to 21 inches; weathered bedrock

*Component note:* The Vinland soils are shallow and have moderate permeability. Included are areas that have dark surface soil less than 7 inches thick. In some places soils are less than 10 inches thick. Also, included are some areas that have slopes from 16 to 20 percent.

**Minor Components**

**Bucyrus**

*Composition:* About 10 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 7 to 15 percent  
*Depth to restrictive feature:* More than 60 inches to bedrock  
*Drainage class:* Moderately well drained  
*Ecological site:* Loamy Upland (pe35-42)

**Summit**

*Composition:* About 5 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 7 to 15 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Clay Upland (pe35-42)

*General Considerations:* Most areas of these soils are in pasture. These soils are suited to hay and or pasture. Available water holding capacity is moderate for the Sibleyville soil and low for the Vinland soil. Erosion is a serious hazard. These soils have good potential for hay, tame grasses, and trees. The depth to bedrock and slope limits the suitability of these soils for many engineering uses. The land capability classification is Vle.

**3461—Sibleyville loam, 3 to 7 percent slopes, eroded**

**Map Unit Composition**

Sibleyville: 85 percent  
 Minor components: 15 percent

**Component Descriptions**

**Sibleyville**

*MLRA:* 112 - Cherokee Prairies  
*Landform:* Hillslope on upland  
*Hillslope position:* Backslope  
*Parent material:* Loamy residuum weathered from sandstone  
*Slope:* 3 to 7 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Well drained

*Slowest permeability:* Moderate (About 0.60 in/hr)

*Available water capacity:* Low (About 4.4 inches)

*Shrink-swell potential:* Low (About 1.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* Medium

*Ecological site:* Loamy Upland (pe35-42)

*Land capability (nonirrigated):* 4e

*Typical Profile:*

Ap—0 to 5 inches; loam

Bt—5 to 12 inches; clay loam

C—12 to 27 inches; channery loam

Cr—27 to 31 inches; weathered bedrock

*Component note:* The Sibleyville soils are moderately deep and have moderate permeability. Shrink-swell potential is low. Included are some areas that have a dark surface soil greater than 6 inches thick. In some places soils have a few sandstone fragments in the surface. Also, included are some areas that have slopes from 8 to 10 percent.

**Minor Components**

**Woodson**

*Composition:* About 10 percent

*Geomorphic Position:* hillslope on upland

*Slope:* 3 to 7 percent

*Drainage class:* Somewhat poorly drained

*Ecological site:* Clay Upland (pe35-42)

**Summit**

*Composition:* About 5 percent

*Geomorphic Position:* hillslope on upland

*Slope:* 3 to 7 percent

*Drainage class:* Moderately well drained

*Ecological site:* Clay Upland (pe35-42)

*General Considerations:* Some areas of this mapunit is cultivated and some is in pasture. Erosion is a serious hazard that can be controlled by terraces, contour farming, or conservation tillage. This soil is suited to grasses. The depth to bedrock limits the suitability of this soil for many engineering uses. The land capability classification is IVe.

**3462—Sibleyville loam, 3 to 7 percent slopes**

**Map Unit Composition**

Sibleyville: 85 percent

Minor components: 15 percent

**Component Descriptions**

**Sibleyville**

*MLRA:* 112 - Cherokee Prairies

*Landform:* Hillslope on upland

*Hillslope position:* Backslope

*Parent material:* Fine-loamy residuum weathered from sandstone

*Slope:* 3 to 7 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Slowest permeability:* Moderate (About 0.60 in/hr)

*Available water capacity:* Low (About 4.5 inches)

*Shrink-swell potential:* Low (About 1.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* Medium

*Ecological site:* Loamy Upland (pe35-42)

*Land capability (nonirrigated):* 3e

*Typical Profile:*

Ap—0 to 7 inches; loam

Bt—7 to 15 inches; loam

C—15 to 27 inches; channery loam

Cr—27 to 31 inches; weathered bedrock

*Component note:* The Sibleyville soils are moderately deep and have moderate permeability. Shrink-swell potential is low. Included are areas that have dark surface soils less than 7 inches. In some places soils have a thicker subsoil. Also, included are some areas that have slopes from 8 to 10 percent.

**Minor Components**

**Woodson**

*Composition:* About 10 percent

*Geomorphic Position:* hillslope on upland

*Slope:* 1 to 3 percent

*Drainage class:* Somewhat poorly drained

*Ecological site:* Clay Upland (pe35-42)

**Summit**

*Composition:* About 5 percent

*Geomorphic Position:* hillslope on upland

*Slope:* 3 to 7 percent

*Drainage class:* Moderately well drained

*Ecological site:* Clay Upland (pe35-42)

*General Considerations:* Most areas of this soil are cultivated. This soil is suited to all crops commonly grown in the watershed. Erosion is a serious hazard, but it can be controlled by contour farming or conservation tillage. This soil has good potential for hay, tame grasses, and trees. The depth to bedrock

limits the suitability of this soil for many engineering uses. The land capability classification is IIIe.

### **3464—Sibleyville-Vinland loams, 3 to 7 percent slopes**

#### **Map Unit Composition**

Sibleyville: 50 percent  
Vinland: 30 percent  
Minor components: 20 percent

#### **Component Descriptions**

##### **Sibleyville**

*MLRA:* 112 - Cherokee Prairies

*Landform:* Hillslope on upland

*Hillslope position:* Backslope

*Parent material:* Residuum weathered from sandstone

*Slope:* 3 to 7 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Slowest permeability:* Moderate (About 0.60 in/hr)

*Available water capacity:* Low (About 4.5 inches)

*Shrink-swell potential:* Low (About 1.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* Medium

*Ecological site:* Loamy Upland (pe35-42)

*Land capability (nonirrigated):* 4e

##### *Typical Profile:*

A—0 to 7 inches; loam

Bt—7 to 15 inches; loam

C—15 to 27 inches; channery loam

Cr—27 to 32 inches; weathered bedrock

*Component note:* The Sibleyville soils are moderately deep and have moderate permeability. Shrink-swell potential is low. Included are some places the dark surface soil is less than 7 inches thick. Some areas have thicker subsoil. Also, included are some areas that have slopes from 8 to 10 percent.

##### **Vinland**

*MLRA:* 112 - Cherokee Prairies

*Landform:* Hillslope on upland

*Hillslope position:* Backslope

*Parent material:* Residuum weathered from shale and siltstone

*Slope:* 3 to 7 percent

*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* Moderate (About 0.60 in/hr)

*Available water capacity:* Low (About 3.4 inches)

*Shrink-swell potential:* Low (About 1.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* Medium

*Ecological site:* Loamy Upland (pe35-42)

*Land capability (nonirrigated):* 6e

##### *Typical Profile:*

A—0 to 7 inches; loam

Bw—7 to 10 inches; silty clay loam

C—10 to 17 inches; silty clay loam

Cr—17 to 30 inches; weathered bedrock

*Component note:* The Vinland soils are shallow and have moderate permeability. In some places the dark surface soil is less than 6 inches thick. Also, included are some areas that have slopes from 8 to 10 percent.

#### **Minor Components**

##### **Summit**

*Composition:* About 10 percent

*Geomorphic Position:* hillslope on upland

*Slope:* 3 to 7 percent

*Drainage class:* Moderately well drained

*Ecological site:* Clay Upland (pe35-42)

##### **Shidler**

*Composition:* About 10 percent

*Geomorphic Position:* hillslope on upland

*Slope:* 3 to 7 percent

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Ecological site:* Shallow Sandstone (pe35-42)

*General Considerations:* Most areas of these soils are used for pasture. These soils are suited to tame pasture and hayground. Erosion is a serious hazard that can be controlled by good cover cover. Available water holding capacity is moderate for the Sibleyville soil and low for the Vinland soil. The depth to bedrock and low clay content limits the suitability of these soils for engineering uses. The land capability classification is IVE.

### 3494—Summit silty clay loam, 1 to 4 percent slopes

*Mapunit Information:* This soil was formerly mapped as Martin in Douglas and Johnson counties.

#### Map Unit Composition

Summit: 85 percent  
Minor components: 15 percent

#### Component Descriptions

##### Summit

*MLRA:* 112 - Cherokee Prairies

*Landform:* Hillslope on upland

*Hillslope position:* Backslope, footslope

*Parent material:* Silty and clayey residuum weathered from acid shale

*Slope:* 1 to 4 percent

*Drainage class:* Moderately well drained

*Slowest permeability:* Slow (About 0.06 in/hr)

*Available water capacity:* High (About 9.6 inches)

*Shrink-swell potential:* High (About 7.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* About 24 to 36 inches

*Runoff class:* High

*Ecological site:* Clay Upland (pe35-42)

*Land capability (nonirrigated):* 2e

##### Typical Profile:

A—0 to 9 inches; silty clay loam

Bt1—9 to 17 inches; silty clay

Bt2—17 to 24 inches; silty clay

Bt3—24 to 41 inches; silty clay

Bt4—41 to 61 inches; silty clay

Bt5—61 to 73 inches; silty clay

*Component note:* The Summit series was formerly mapped as Martin in Douglas and Johnson County Soil Surveys. The Summit soils are very deep and have slow permeability. Shrink-swell potential is high. In some areas the soil is 40 to 60 inches to shale bedrock. In some places have dark surface soil is less than 7 inches thick. Also, included are some areas that have slopes from 5 to 8 percent.

#### Minor Components

##### Kenoma

*Composition:* About 10 percent

*Slope:* 1 to 4 percent

*Drainage class:* Moderately well drained

*Ecological site:* Clay Upland (pe35-42)

##### Wagstaff

*Composition:* About 5 percent

*Geomorphic Position:* hillslope on upland

*Slope:* 1 to 3 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Moderately well drained

*Ecological site:* Loamy Upland (pe35-42)

*General Considerations:* Most areas of this soil are cultivated. It is well suited to all crops commonly grown in the watershed. Erosion is a serious hazard that can be controlled by terraces, contour farming, or conservation tillage. This soil has good potential for hay, tame grasses, and trees. The wetness limits the suitability of this soil for many engineering uses. The land capability classification is 1le.

### 3495—Summit silty clay loam, 4 to 8 percent slopes

*Mapunit Information:* This soil mapunit was formerly mapped as Martin in Douglas and Johnson counties.

#### Map Unit Composition

Summit: 85 percent  
Minor components: 15 percent

#### Component Descriptions

##### Summit

*MLRA:* 112 - Cherokee Prairies

*Landform:* Hillslope on upland

*Hillslope position:* Backslope

*Parent material:* Silty and clayey residuum weathered from acid shale

*Slope:* 4 to 8 percent

*Drainage class:* Moderately well drained

*Slowest permeability:* Slow (About 0.06 in/hr)

*Available water capacity:* Moderate (About 8.6 inches)

*Shrink-swell potential:* High (About 7.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* About 21 to 26 inches

*Runoff class:* Very high

*Ecological site:* Clay Upland (pe35-42)

*Land capability (nonirrigated):* 3e

##### Typical Profile:

A—0 to 9 inches; silty clay loam

Bt1—9 to 17 inches; silty clay

Bt2—17 to 24 inches; silty clay

Bt3—24 to 41 inches; silty clay

Bt4—41 to 61 inches; silty clay

Bt5—61 to 73 inches; silty clay

*Component note:* The Summit series was formerly mapped as Martin in Douglas and Johnson Counties. The Summit soils are very deep and have slow permeability. Shrink-swell potential is high. In some places the soil is 40 to 60 inches to shale bedrock. Some areas the dark soil surface is less than 7 inches thick. Also, included are some areas that have slopes from 9 to 12 percent.

#### Minor Components

##### Wagstaff

*Composition:* About 5 percent

*Geomorphic Position:* hillslope on upland

*Slope:* 4 to 8 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Moderately well drained

*Ecological site:* Loamy Upland (pe35-42)

##### Shidler

*Composition:* About 5 percent

*Geomorphic Position:* hillslope on upland

*Slope:* 4 to 8 percent

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Ecological site:* Shallow Sandstone (pe35-42)

##### Dennis

*Composition:* About 5 percent

*Geomorphic Position:* hillslope on upland

*Slope:* 4 to 8 percent

*Drainage class:* Moderately well drained

*Ecological site:* Loamy Upland (pe35-42)

*General Considerations:* Most areas of this soil are pasture. This soil is suited for tall fescue and brome grass. Some small areas are cultivated. Erosion is a serious hazard that can be controlled by terraces, contour farming, or conservation tillage. This soil has good potential for hay, tame grasses, and trees. The wetness limits the suitability of this soil for many engineering uses. The land capability classification is IIIe.

### 3815—Verdigris silt loam, 0 to 2 percent slopes, frequently flooded

*Mapunit Information:* This soil was formerly mapped as Kennebec in Douglas County and Johnson County. This map unit is adjacent to the stream channel.

## Map Unit Composition

Verdigris: 85 percent

Minor components: 15 percent

## Component Descriptions

### Verdigris

*MLRA:* 112 - Cherokee Prairies

*Landform:* Flood plain on valley

*Parent material:* Fine-silty alluvium

*Slope:* 0 to 2 percent

*Drainage class:* Moderately well drained

*Slowest permeability:* Moderate (About 0.60 in/hr)

*Available water capacity:* High (About 12.0 inches)

*Shrink-swell potential:* Moderate (About 4.5 LEP)

*Flooding hazard:* Frequent

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* Low

*Ecological site:* Loamy Lowland (pe35-42)

*Land capability (nonirrigated):* 5w

#### Typical Profile:

Ap—0 to 9 inches; silt loam

A1—9 to 27 inches; silt loam

A2—27 to 32 inches; silt loam

AC—32 to 52 inches; silt loam

C—52 to 60 inches; silt loam

*Component note:* The Verdigris series was formerly mapped as the Kennebec series in the Douglas and Johnson County Soil Surveys. The Verdigris soils are very deep and have moderate permeability. Included are some places the dark surface soil is less than 10 inches thick. Also, included are some areas that have slopes from 3 to 5 percent.

#### Minor Components

##### Summit

*Composition:* About 10 percent

*Geomorphic Position:* hillslope on upland

*Slope:* 2 to 8 percent

*Drainage class:* Moderately well drained

*Ecological site:* Clay Upland (pe35-42)

##### Osage

*Composition:* About 5 percent

*Geomorphic Position:* flood plain on valley

*Slope:* 0 to 2 percent

*Drainage class:* Somewhat poorly drained

*Ecological site:* Clay Lowland (pe35-42)

*General Considerations:* Most areas of this soil are pasture and trees. This soil is suited for

pasture or trees. This soil is suited to tall fescue and reed canarygrass. Flooding limits the suitability of this soil for many engineering uses. The land capability classification is Vw.

### 3926—Water

### 3951—Woodson silt loam, 1 to 3 percent slopes

#### Map Unit Composition

Woodson: 85 percent  
Minor components: 15 percent

#### Component Descriptions

##### Woodson

*MLRA:* 112 - Cherokee Prairies

*Landform:* Paleoterrace on upland

*Hillslope position:* Summit

*Parent material:* Silty and clayey sediments

*Slope:* 1 to 3 percent

*Drainage class:* Somewhat poorly drained

*Slowest permeability:* Very slow (About 0.00 in/hr)

*Available water capacity:* Moderate (About 8.7 inches)

*Shrink-swell potential:* High (About 7.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* About 4 to 9 inches

*Runoff class:* Medium

*Ecological site:* Clay Upland (pe35-42)

*Land capability (nonirrigated):* 3e

##### Typical Profile:

A—0 to 10 inches; silt loam

Bt1—10 to 21 inches; silty clay

Bt2—21 to 30 inches; silty clay

BC—30 to 48 inches; silty clay

C—48 to 60 inches; silty clay

*Component note:* The Woodson soils are very deep and have very slow permeability. Included are some areas the soils formed in glacial till. In some places the dark surface soil is less than 7 inches thick. Also, included are some areas that have slopes from 0 to 1 percent.

#### Minor Components

##### Kenoma

*Composition:* About 10 percent

*Slope:* 1 to 4 percent

*Drainage class:* Moderately well drained

*Ecological site:* Clay Upland (pe35-42)

##### Summit

*Composition:* About 5 percent

*Geomorphic Position:* hillslope on upland

*Slope:* 1 to 3 percent

*Drainage class:* Moderately well drained

*Ecological site:* Clay Upland (pe35-42)

*General Considerations:* Most areas of this soil are cultivated. This soil is suited to most crops grown in the watershed. Wetness and seasonal droughtiness can limit crops in some years. Erosion is a slight hazard that can be controlled by conservation tillage or no-tills. This soil is well suited to tame grasses. The wetness limits the suitability of this soil for engineering uses. The land capability classification is IIs.

### AED—Arents, Earthen Dam

### Be—Basehor complex, 7 to 15 percent slopes

#### Map Unit Composition

Basehor: 50 percent

Minor components: 50 percent

#### Component Descriptions

##### Basehor

*MLRA:* 112 - Cherokee Prairies

*Landform:* Hillslope on upland

*Parent material:* Loamy residuum weathered from sandstone

*Slope:* 7 to 15 percent

*Depth to restrictive feature:* 8 to 20 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* Moderately rapid (About 2.00 in/hr)

*Available water capacity:* Very low (About 2.2 inches)

*Shrink-swell potential:* Low (About 1.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* More than 6 feet  
*Runoff class:* Low  
*Ecological site:* Shallow Savannah (pe30-37)  
*Land capability (nonirrigated):* 6s

*Typical Profile:*

H1—0 to 12 inches; loam  
 R—12 to 16 inches; unweathered bedrock

**Minor Components**

**Unnamed Soil**

*Phase:* Moderately Deep  
*Composition:* About 25 percent  
*Slope:* 7 to 15 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Ecological site:* Shallow Savannah (pe30-37)

**Unnamed Soil**

*Phase:* Deep  
*Composition:* About 20 percent  
*Slope:* 7 to 15 percent  
*Depth to restrictive feature:* 40 to 60 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Ecological site:* Shallow Savannah (pe30-37)

**Vinland**

*Composition:* About 3 percent  
*Slope:* 7 to 15 percent  
*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)  
*Drainage class:* Somewhat excessively drained  
*Ecological site:* Loamy Upland (pe35-42)

**Rock outcrop**

*Composition:* About 2 percent  
*Slope:* 7 to 15 percent  
*Depth to restrictive feature:* 0 inches to bedrock (lithic)

**BOP—Borrow Pits**

*General Considerations:* An open excavation from which soil and underlying material have been removed usually for construction purposes.

**Et—Eudora silt loam, rarely flooded**

**Map Unit Composition**

Eudora: 90 percent  
 Minor components: 10 percent

**Component Descriptions**

**Eudora**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills  
*Landform:* Flood plain on river valley  
*Parent material:* Coarse-silty alluvium  
*Slope:* 0 to 1 percent  
*Drainage class:* Well drained  
*Slowest permeability:* Moderate (About 0.60 in/hr)  
*Available water capacity:* Very high (About 12.0 inches)  
*Shrink-swell potential:* Low (About 1.5 LEP)  
*Flooding hazard:* Rare  
*Depth to seasonal water saturation:* More than 6 feet  
*Runoff class:* Low  
*Ecological site:* Loamy Lowland (pe30-37)  
*Land capability (nonirrigated):* 1

*Typical Profile:*

H1—0 to 12 inches; silt loam  
 H2—12 to 72 inches; silt loam

**Minor Components**

**Kimo**

*Composition:* About 5 percent  
*Slope:* 0 to 1 percent  
*Drainage class:* Somewhat poorly drained  
*Ecological site:* Clay Lowland (pe30-37)

**Sarpy**

*Composition:* About 5 percent  
*Slope:* 0 to 2 percent  
*Drainage class:* Somewhat excessively drained  
*Ecological site:* Sandy Lowland (pe30-37)

**Unnamed Hydric Soil**

*Drainage class:* Poorly drained



## Ev—Eudora-Kimo complex, rarely flooded

### Map Unit Composition

Eudora: 60 percent  
Kimo: 30 percent  
Minor components: 10 percent

### Component Descriptions

#### Eudora

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills

*Landform:* Flood plain on river valley

*Parent material:* Coarse-silty alluvium

*Slope:* 0 to 2 percent

*Drainage class:* Well drained

*Slowest permeability:* Moderate (About 0.60 in/hr)

*Available water capacity:* Very high (About 12.0 inches)

*Shrink-swell potential:* Low (About 1.5 LEP)

*Flooding hazard:* Rare

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* Low

*Ecological site:* Loamy Lowland (pe30-37)

*Land capability (nonirrigated):* 2w

#### Typical Profile:

H1—0 to 12 inches; silt loam

H2—12 to 72 inches; silt loam

#### Kimo

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills

*Landform:* Flood plain on river valley

*Parent material:* Clayey over loamy alluvium

*Slope:* 0 to 1 percent

*Drainage class:* Somewhat poorly drained

*Slowest permeability:* Slow (About 0.06 in/hr)

*Available water capacity:* High (About 11.3 inches)

*Shrink-swell potential:* High (About 7.5 LEP)

*Flooding hazard:* Rare

*Depth to seasonal water saturation:* About 22 to 26 inches

*Runoff class:* Medium

*Ecological site:* Clay Lowland (pe30-37)

*Land capability (nonirrigated):* 2w

#### Typical Profile:

H1—0 to 6 inches; silty clay loam

H2—6 to 28 inches; silty clay

H3—28 to 60 inches; silt loam

## Minor Components

### Sarpy

*Composition:* About 5 percent

*Slope:* 0 to 2 percent

*Drainage class:* Somewhat excessively drained

*Ecological site:* Sandy Lowland (pe30-37)

### Wabash

*Composition:* About 5 percent

*Slope:* 0 to 1 percent

*Drainage class:* Poorly drained

*Ecological site:* Clay Lowland (pe30-37)

## Ew—Eudora-Kimo fine sandy loams, overwash, rarely flooded

### Map Unit Composition

Eudora: 65 percent  
Kimo: 25 percent  
Minor components: 10 percent

### Component Descriptions

#### Eudora

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills

*Landform:* Flood plain on river valley

*Parent material:* Coarse-silty alluvium

*Slope:* 0 to 2 percent

*Drainage class:* Well drained

*Slowest permeability:* Moderate (About 0.60 in/hr)

*Available water capacity:* High (About 11.5 inches)

*Shrink-swell potential:* Low (About 1.5 LEP)

*Flooding hazard:* Rare

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* Low

*Ecological site:* Loamy Lowland (pe30-37)

*Land capability (nonirrigated):* 1

#### Typical Profile:

H1—0 to 12 inches; fine sandy loam

H2—12 to 72 inches;

#### Kimo

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills

*Landform:* Flood plain on river valley

*Parent material:* Silty and clayey alluvium

*Slope:* 0 to 1 percent

*Drainage class:* Poorly drained

*Slowest permeability:* Slow (About 0.06 in/hr)  
*Available water capacity:* High (About 11.1 inches)  
*Shrink-swell potential:* High (About 7.5 LEP)  
*Flooding hazard:* Rare  
*Depth to seasonal water saturation:* About 24 to 72 inches  
*Runoff class:* Medium  
*Ecological site:* Clay Lowland (pe30-37)  
*Land capability (nonirrigated):* 2w

*Typical Profile:*  
 H1—0 to 15 inches; fine sandy loam  
 H2—15 to 28 inches; silty clay  
 H3—28 to 60 inches; silt loam

#### Minor Components

##### Sarpy

*Composition:* About 10 percent  
*Slope:* 0 to 2 percent  
*Drainage class:* Somewhat excessively drained  
*Ecological site:* Sandy Lowland (pe30-37)

#### Typical Profile:

H1—0 to 15 inches; silt loam  
 H2—15 to 30 inches; silty clay loam  
 H3—30 to 80 inches; silty clay loam

#### Minor Components

##### Oska

*Composition:* About 5 percent  
*Slope:* 3 to 6 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe35-42)

##### Martin

*Composition:* About 5 percent  
*Slope:* 3 to 6 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Loamy Upland (pe35-42)

##### Wabash

*Composition:* About 5 percent  
*Slope:* 0 to 1 percent  
*Drainage class:* Poorly drained  
*Ecological site:* Clay Lowland (pe30-37)

### Gm—Gymer silt loam, 1 to 3 percent slopes

#### Map Unit Composition

Gymer: 85 percent  
 Minor components: 15 percent

#### Component Descriptions

##### Gymer

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills, 112 - Cherokee Prairies  
*Landform:* Hillslope on upland  
*Parent material:* Silty and clayey residuum weathered from limestone and shale  
*Slope:* 1 to 3 percent  
*Drainage class:* Well drained  
*Slowest permeability:* Moderately slow (About 0.20 in/hr)  
*Available water capacity:* High (About 11.4 inches)  
*Shrink-swell potential:* Moderate (About 4.5 LEP)  
*Flooding hazard:* None  
*Depth to seasonal water saturation:* More than 6 feet  
*Runoff class:* Medium  
*Ecological site:* Loamy Upland (pe30-37)  
*Land capability (nonirrigated):* 2e

### Gy—Gymer silt loam, 3 to 8 percent slopes

#### Map Unit Composition

Gymer: 88 percent  
 Minor components: 12 percent

#### Component Descriptions

##### Gymer

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills  
*Landform:* Terrace on river valley  
*Hillslope position:* Backslope  
*Parent material:* Fine-silty alluvium  
*Slope:* 3 to 8 percent  
*Drainage class:* Well drained  
*Slowest permeability:* Moderately slow (About 0.20 in/hr)  
*Available water capacity:* High (About 11.3 inches)  
*Shrink-swell potential:* Moderate (About 4.5 LEP)  
*Flooding hazard:* None  
*Depth to seasonal water saturation:* More than 6 feet  
*Runoff class:* High  
*Ecological site:* Loamy Upland (pe30-37)  
*Land capability (nonirrigated):* 3e

*Typical Profile:*

H1—0 to 15 inches; silt loam  
 H2—15 to 34 inches; silty clay loam  
 H3—34 to 68 inches; silty clay loam

**Minor Components****Morrill**

*Composition:* About 3 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 3 to 7 percent  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe30-37)

**Martin**

*Composition:* About 3 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 3 to 7 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Loamy Upland (pe35-42)

**Thurman**

*Composition:* About 3 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 4 to 10 percent  
*Drainage class:* Somewhat excessively drained  
*Ecological site:* Savannah (pe30-37)

**Sharpsburg**

*Composition:* About 3 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 4 to 10 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Loamy Upland (pe30-37)

**Ju—Judson silt loam, rarely flooded****Map Unit Composition**

Judson: 85 percent  
 Minor components: 15 percent

**Component Descriptions****Judson**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills  
*Landform:* Terrace on river valley  
*Parent material:* Fine-silty alluvium  
*Slope:* 0 to 1 percent  
*Drainage class:* Well drained  
*Slowest permeability:* Moderate (About 0.60 in/hr)  
*Available water capacity:* Very high (About 13.0 inches)

*Shrink-swell potential:* Moderate (About 4.5 LEP)

*Flooding hazard:* Rare

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* Negligible

*Ecological site:* Loamy Lowland (pe30-37)

*Land capability (nonirrigated):* 1

*Typical Profile:*

H1—0 to 21 inches; silt loam  
 H2—21 to 47 inches; silty clay loam  
 H3—47 to 60 inches; silt loam

**Minor Components****Eudora**

*Composition:* About 5 percent  
*Slope:* 0 to 1 percent  
*Drainage class:* Well drained  
*Ecological site:* Loamy Lowland (pe30-37)

**Reading**

*Composition:* About 5 percent  
*Slope:* 0 to 2 percent  
*Drainage class:* Well drained  
*Ecological site:* Loamy Lowland (pe35-42)

**Wabash**

*Composition:* About 5 percent  
*Slope:* 0 to 1 percent  
*Drainage class:* Poorly drained  
*Ecological site:* Clay Lowland (pe30-37)

**KA—Kennebec silt loam,  
 channeled  
 Map Unit Composition**

Kennebec: 99 percent  
 Minor components: 1 percent

**Component Descriptions****Kennebec**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills  
*Landform:* Flood plain on valley  
*Parent material:* Fine-silty alluvium  
*Slope:* 0 to 2 percent  
*Drainage class:* Moderately well drained  
*Slowest permeability:* Moderate (About 0.60 in/hr)  
*Available water capacity:* Very high (About 13.3 inches)  
*Shrink-swell potential:* Moderate (About 4.5 LEP)  
*Flooding hazard:* Frequent

*Depth to seasonal water saturation:* About 36 to 60 inches  
*Runoff class:* Low  
*Land capability (nonirrigated):* 5w

*Typical Profile:*  
 H1—0 to 45 inches; silt loam  
 H2—45 to 72 inches; silt loam

#### Minor Components

**Bremer**  
*Composition:* About 1 percent

### Kb—Kennebec silt loam, occasionally flooded

#### Map Unit Composition

Kennebec: 95 percent  
 Minor components: 5 percent

#### Component Descriptions

**Kennebec**  
*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills  
*Landform:* Flood plain on valley  
*Parent material:* Fine-silty alluvium  
*Slope:* 0 to 2 percent  
*Drainage class:* Moderately well drained  
*Slowest permeability:* Moderate (About 0.60 in/hr)  
*Available water capacity:* Very high (About 13.4 inches)  
*Shrink-swell potential:* Moderate (About 4.5 LEP)  
*Flooding hazard:* Occasional  
*Depth to seasonal water saturation:* About 40 to 44 inches  
*Runoff class:* Low  
*Ecological site:* Loamy Lowland (pe35-42)  
*Land capability (nonirrigated):* 2w

*Typical Profile:*  
 H1—0 to 48 inches; silt loam  
 H2—48 to 60 inches; silt loam

#### Minor Components

**Wabash**  
*Composition:* About 4 percent  
*Slope:* 0 to 1 percent  
*Drainage class:* Poorly drained  
*Ecological site:* Clay Lowland (pe30-37)

#### Unnamed Hydric Soil

*Composition:* About 1 percent  
*Slope:* 0 to 2 percent  
*Drainage class:* Poorly drained

### Kc—Kennebec Soils, channeled

#### Map Unit Composition

Kennebec: 88 percent  
 Minor components: 12 percent

#### Component Descriptions

**Kennebec**  
*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills  
*Landform:* Flood plain on river valley  
*Parent material:* Silty alluvium  
*Slope:* 0 to 1 percent  
*Drainage class:* Moderately well drained  
*Slowest permeability:* Moderate (About 0.60 in/hr)  
*Available water capacity:* Very high (About 12.6 inches)  
*Shrink-swell potential:* Moderate (About 4.5 LEP)  
*Flooding hazard:* Frequent  
*Depth to seasonal water saturation:* About 40 to 44 inches  
*Runoff class:* Low  
*Ecological site:* Loamy Lowland (pe30-37)  
*Land capability (nonirrigated):* 5w

*Typical Profile:*  
 H1—0 to 10 inches; silty clay loam  
 H2—10 to 60 inches; silty clay loam

#### Minor Components

**Wabash**  
*Composition:* About 3 percent  
*Slope:* 0 to 1 percent  
*Drainage class:* Poorly drained  
*Ecological site:* Clay Lowland (pe30-37)

#### Vinland

*Composition:* About 3 percent  
*Slope:* 3 to 7 percent  
*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)  
*Drainage class:* Somewhat excessively drained  
*Ecological site:* Loamy Upland (pe35-42)

#### Sogn

*Composition:* About 3 percent  
*Slope:* 5 to 20 percent

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Somewhat excessively drained  
*Ecological site:* Shallow Limy (pe35-42)

**Martin**

*Composition:* About 3 percent  
*Slope:* 3 to 7 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Loamy Upland (pe35-42)

**Km—Kimo silty clay loam, rarely flooded****Map Unit Composition**

Kimo: 90 percent  
 Minor components: 10 percent

**Component Descriptions****Kimo**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills  
*Landform:* Flood plain on river valley  
*Parent material:* Clayey over loamy alluvium  
*Slope:* 0 to 1 percent  
*Drainage class:* Somewhat poorly drained  
*Slowest permeability:* Slow (About 0.06 in/hr)  
*Available water capacity:* High (About 11.3 inches)  
*Shrink-swell potential:* High (About 7.5 LEP)  
*Flooding hazard:* Rare  
*Depth to seasonal water saturation:* About 22 to 26 inches  
*Runoff class:* Medium  
*Ecological site:* Clay Lowland (pe30-37)  
*Land capability (nonirrigated):* 2w

*Typical Profile:*

H1—0 to 6 inches; silty clay loam  
 H2—6 to 28 inches; silty clay  
 H3—28 to 60 inches; silt loam

**Minor Components****Wabash**

*Composition:* About 5 percent  
*Slope:* 0 to 1 percent  
*Drainage class:* Poorly drained  
*Ecological site:* Clay Lowland (pe30-37)

**Eudora**

*Composition:* About 5 percent  
*Slope:* 0 to 1 percent  
*Drainage class:* Well drained  
*Ecological site:* Loamy Lowland (pe30-37)

**Le—Leanna silt loam, 0 to 2 percent slopes, occasionally flooded****Map Unit Composition**

Leanna: 85 percent  
 Minor components: 15 percent

**Component Descriptions****Leanna**

*MLRA:* 112 - Cherokee Prairies  
*Landform:* Flood plain on river valley  
*Parent material:* Silty and clayey alluvium  
*Slope:* 0 to 2 percent  
*Drainage class:* Somewhat poorly drained  
*Slowest permeability:* Very slow (About 0.00 in/hr)  
*Available water capacity:* High (About 10.8 inches)  
*Shrink-swell potential:* High (About 7.5 LEP)  
*Flooding hazard:* Occasional  
*Depth to seasonal water saturation:* About 6 to 24 inches  
*Runoff class:* High  
*Ecological site:* Loamy Lowland (pe35-42)  
*Land capability (nonirrigated):* 2w

*Typical Profile:*

H1—0 to 22 inches; silt loam  
 H2—22 to 40 inches; silty clay  
 H3—40 to 78 inches; silty clay

**Minor Components****Wabash**

*Composition:* About 5 percent

**Kennebec**

*Composition:* About 5 percent  
*Slope:* 0 to 1 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Loamy Lowland (pe30-37)

**Reading**

*Composition:* About 5 percent  
*Slope:* 0 to 2 percent  
*Drainage class:* Well drained  
*Ecological site:* Loamy Lowland (pe35-42)

**M-W—Miscellaneous Water****Mb—Martin silty clay loam, 1 to 3 percent slopes****Map Unit Composition**

Martin: 90 percent  
 Minor components: 10 percent

**Component Descriptions****Martin**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills, 112 - Cherokee Prairies

*Landform:* Hillslope on upland

*Parent material:* Silty and clayey colluvium derived from limestone and shale over silty and clayey residuum weathered from limestone and shale

*Slope:* 1 to 3 percent

*Drainage class:* Moderately well drained

*Slowest permeability:* Slow (About 0.06 in/hr)

*Available water capacity:* High (About 9.7 inches)

*Shrink-swell potential:* High (About 7.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* About 22 to 26 inches

*Runoff class:* High

*Ecological site:* Loamy Upland (pe35-42)

*Land capability (nonirrigated):* 2e

**Typical Profile:**

H1—0 to 9 inches; silty clay loam  
 H2—9 to 14 inches; silty clay loam  
 H3—14 to 60 inches; silty clay

**Minor Components****Pawnee**

*Composition:* About 5 percent

*Slope:* 1 to 3 percent

*Drainage class:* Moderately well drained

*Ecological site:* Clay Upland (pe30-37)

**Woodson**

*Composition:* About 5 percent

*Slope:* 0 to 1 percent

*Drainage class:* Somewhat poorly drained

*Ecological site:* Clay Upland (pe35-42)

**Mc—Martin silty clay loam, 3 to 7 percent slopes****Map Unit Composition**

Martin: 85 percent  
 Minor components: 15 percent

**Component Descriptions****Martin**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills, 112 - Cherokee Prairies

*Landform:* Hillslope on upland

*Hillslope position:* Backslope

*Parent material:* Silty and clayey colluvium derived from limestone and shale over silty and

clayey residuum weathered from limestone and shale

*Slope:* 3 to 7 percent

*Drainage class:* Moderately well drained

*Slowest permeability:* Slow (About 0.06 in/hr)

*Available water capacity:* High (About 9.7 inches)

*Shrink-swell potential:* High (About 7.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* About 21 to 26 inches

*Runoff class:* High

*Ecological site:* Loamy Upland (pe35-42)

*Land capability (nonirrigated):* 3e

**Typical Profile:**

H1—0 to 9 inches; silty clay loam  
 H2—9 to 14 inches; silty clay loam  
 H3—14 to 60 inches; silty clay

**Minor Components****Sogn**

*Composition:* About 3 percent

*Geomorphic Position:* hillslope on upland

*Slope:* 7 to 15 percent

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Somewhat excessively drained

*Ecological site:* Shallow Limy (pe30-37)

**Pawnee**

*Composition:* About 3 percent

*Geomorphic Position:* hillslope on upland

*Slope:* 1 to 3 percent

*Drainage class:* Moderately well drained

*Ecological site:* Clay Upland (pe30-37)

**Oska**

*Composition:* About 3 percent

*Slope:* 3 to 6 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe35-42)

**Gymer**

*Composition:* About 3 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 3 to 8 percent  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe30-37)

**Vinland**

*Composition:* About 2 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 3 to 7 percent  
*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)  
*Drainage class:* Somewhat excessively drained  
*Ecological site:* Loamy Upland (pe35-42)

**Sibleyville**

*Phase:* Eroded  
*Composition:* About 1 percent  
*Slope:* 3 to 7 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe35-42)

**Mh—Martin Soils, 3 to 7 percent slopes, eroded****Map Unit Composition**

Martin: 85 percent  
 Minor components: 15 percent

**Component Descriptions****Martin**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills, 112 - Cherokee Prairies  
*Landform:* Hillslope on upland  
*Parent material:* Silty and clayey colluvium derived from limestone and shale over silty and clayey residuum weathered from limestone and shale  
*Slope:* 3 to 7 percent  
*Drainage class:* Moderately well drained  
*Slowest permeability:* Slow (About 0.06 in/hr)  
*Available water capacity:* High (About 9.7 inches)  
*Shrink-swell potential:* High (About 7.5 LEP)  
*Flooding hazard:* None

*Depth to seasonal water saturation:* More than 6 feet  
*Runoff class:* High  
*Ecological site:* Loamy Upland (pe35-42)  
*Land capability (nonirrigated):* 4e

**Typical Profile:**

H1—0 to 9 inches; silty clay loam  
 H2—9 to 14 inches; silty clay loam  
 H3—14 to 60 inches; silty clay

**Minor Components****Sibleyville**

*Phase:* Eroded  
*Composition:* About 5 percent  
*Slope:* 3 to 7 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe35-42)

**Sogn**

*Composition:* About 5 percent  
*Slope:* 5 to 20 percent  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Somewhat excessively drained  
*Ecological site:* Shallow Limy (pe35-42)

**Vinland**

*Composition:* About 3 percent  
*Slope:* 7 to 15 percent  
*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)  
*Drainage class:* Somewhat excessively drained  
*Ecological site:* Loamy Upland (pe35-42)

**Pawnee**

*Composition:* About 2 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 1 to 3 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Clay Upland (pe30-37)

**Mo—Martin-Oska silty clay loams, 3 to 6 percent slopes**  
**Map Unit Composition**

Martin: 40 percent  
 Oska: 30 percent  
 Minor components: 30 percent

**Component Descriptions****Martin**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills, 112 - Cherokee Prairies

*Landform:* Hillslope on upland

*Parent material:* Silty and clayey colluvium derived from limestone and shale over silty and

clayey residuum weathered from limestone and shale

*Slope:* 3 to 6 percent

*Drainage class:* Moderately well drained

*Slowest permeability:* Slow (About 0.06 in/hr)

*Available water capacity:* High (About 9.7 inches)

*Shrink-swell potential:* High (About 7.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* About 22 to 26 inches

*Runoff class:* High

*Ecological site:* Loamy Upland (pe35-42)

*Land capability (nonirrigated):* 3e

*Typical Profile:*

H1—0 to 9 inches; silty clay loam

H2—9 to 14 inches; silty clay loam

H3—14 to 60 inches; silty clay

### **Oska**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills, 112 - Cherokee Prairies

*Landform:* Hillslope on upland

*Parent material:* Silty and clayey residuum weathered from limestone and shale

*Slope:* 3 to 6 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* Slow (About 0.06 in/hr)

*Available water capacity:* Moderate (About 6.3 inches)

*Shrink-swell potential:* High (About 7.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* High

*Ecological site:* Loamy Upland (pe35-42)

*Land capability (nonirrigated):* 3e

*Typical Profile:*

H1—0 to 5 inches; silty clay loam

H2—5 to 38 inches; silty clay

R—38 to 42 inches; unweathered bedrock

### **Minor Components**

#### **Unnamed Soils**

*Composition:* About 25 percent

*Slope:* 3 to 6 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Well drained

*Ecological site:* Loamy Upland (pe35-42)

### **Sogn**

*Composition:* About 3 percent

*Slope:* 5 to 20 percent

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Somewhat excessively drained

*Ecological site:* Shallow Limy (pe30-37)

### **Vinland**

*Composition:* About 2 percent

*Slope:* 5 to 20 percent

*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)

*Drainage class:* Somewhat excessively drained

*Ecological site:* Loamy Upland (pe30-37)

## **Mr—Morrill clay loam, 3 to 7 percent slopes**

### **Map Unit Composition**

Morrill: 90 percent

Minor components: 10 percent

### **Component Descriptions**

#### **Morrill**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills

*Landform:* Hillslope on upland

*Parent material:* Fine-loamy glaciofluvial deposits

*Slope:* 3 to 7 percent

*Drainage class:* Well drained

*Slowest permeability:* Moderately slow (About 0.20 in/hr)

*Available water capacity:* High (About 10.1 inches)

*Shrink-swell potential:* Moderate (About 4.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* Medium

*Ecological site:* Loamy Upland (pe30-37)

*Land capability (nonirrigated):* 3e

*Typical Profile:*

H1—0 to 10 inches; clay loam

H2—10 to 56 inches; clay loam

H3—56 to 66 inches; clay loam



**Minor Components****Oska**

*Composition:* About 5 percent  
*Slope:* 3 to 6 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe35-42)

**Pawnee**

*Composition:* About 5 percent  
*Slope:* 1 to 3 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Clay Upland (pe30-37)

**Ms—Morrill clay loam, 7 to 12 percent slopes****Map Unit Composition**

Morrill: 85 percent  
 Minor components: 15 percent

**Component Descriptions****Morrill**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills

*Landform:* Hillslope on upland

*Parent material:* Fine-loamy glaciofluvial deposits

*Slope:* 7 to 12 percent

*Drainage class:* Well drained

*Slowest permeability:* Moderately slow (About 0.20 in/hr)

*Available water capacity:* High (About 10.1 inches)

*Shrink-swell potential:* Moderate (About 4.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* High

*Ecological site:* Loamy Upland (pe30-37)

*Land capability (nonirrigated):* 4e

*Typical Profile:*

H1—0 to 10 inches; clay loam

H2—10 to 56 inches; clay loam

H3—56 to 66 inches; clay loam

**Minor Components****Martin**

*Composition:* About 5 percent  
*Slope:* 3 to 6 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Loamy Upland (pe35-42)

**Pawnee**

*Composition:* About 5 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 3 to 7 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Clay Upland (pe30-37)

**Thurman**

*Composition:* About 3 percent  
*Slope:* 4 to 10 percent  
*Drainage class:* Excessively drained  
*Ecological site:* Savannah (pe30-37)

**Basehor**

*Composition:* About 2 percent  
*Slope:* 7 to 15 percent  
*Depth to restrictive feature:* 8 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Ecological site:* Shallow Savannah (pe30-37)

**Oe—Oska silty clay loam, 3 to 6 percent slopes****Map Unit Composition**

Oska: 88 percent  
 Minor components: 12 percent

**Component Descriptions****Oska**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills

*Landform:* Hillslope on upland

*Parent material:* Silty and clayey residuum weathered from limestone and shale

*Slope:* 3 to 6 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Well drained

*Slowest permeability:* Slow (About 0.06 in/hr)

*Available water capacity:* Moderate (About 6.3 inches)

*Shrink-swell potential:* High (About 7.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* High

*Ecological site:* Loamy Upland (pe35-42)

*Land capability (nonirrigated):* 3e

*Typical Profile:*

H1—0 to 5 inches; silty clay loam  
 H2—5 to 38 inches; silty clay  
 R—38 to 42 inches; unweathered bedrock

**Minor Components****Gymer**

*Composition:* About 3 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 3 to 8 percent  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe30-37)

**Martin**

*Composition:* About 3 percent  
*Slope:* 3 to 7 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Loamy Upland (pe35-42)

**Vinland**

*Composition:* About 3 percent  
*Slope:* 3 to 7 percent  
*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)  
*Drainage class:* Somewhat excessively drained  
*Ecological site:* Loamy Upland (pe35-42)

**Sogn**

*Composition:* About 3 percent  
*Slope:* 7 to 15 percent  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Somewhat excessively drained  
*Ecological site:* Shallow Limy (pe30-37)

**Pb—Pawnee clay loam, 1 to 3 percent slopes****Map Unit Composition**

Pawnee: 90 percent  
 Minor components: 10 percent

**Component Descriptions****Pawnee**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills  
*Landform:* Hillslope on upland  
*Hillslope position:* Shoulder, backslope  
*Parent material:* Clayey drift  
*Slope:* 1 to 3 percent  
*Drainage class:* Moderately well drained  
*Slowest permeability:* Slow (About 0.06 in/hr)

*Available water capacity:* Moderate (About 8.3 inches)

*Shrink-swell potential:* High (About 7.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* About 9 to 14 inches

*Runoff class:* High

*Ecological site:* Clay Upland (pe30-37)

*Land capability (nonirrigated):* 2e

*Typical Profile:*

H1—0 to 14 inches; clay loam  
 H2—14 to 34 inches; clay  
 H3—34 to 72 inches; sandy clay loam

**Minor Components****Martin**

*Composition:* About 5 percent  
*Slope:* 3 to 6 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Loamy Upland (pe35-42)

**Woodson**

*Composition:* About 5 percent  
*Slope:* 0 to 1 percent  
*Drainage class:* Somewhat poorly drained  
*Ecological site:* Clay Upland (pe35-42)

**Pc—Pawnee clay loam, 3 to 7 percent slopes****Map Unit Composition**

Pawnee: 85 percent  
 Minor components: 15 percent

**Component Descriptions****Pawnee**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills  
*Landform:* Hillslope on upland  
*Hillslope position:* Backslope  
*Parent material:* Clayey drift  
*Slope:* 3 to 7 percent  
*Drainage class:* Moderately well drained  
*Slowest permeability:* Slow (About 0.06 in/hr)  
*Available water capacity:* Moderate (About 8.3 inches)  
*Shrink-swell potential:* High (About 7.5 LEP)  
*Flooding hazard:* None  
*Depth to seasonal water saturation:* About 9 to 14 inches  
*Runoff class:* High  
*Ecological site:* Clay Upland (pe30-37)

*Land capability (nonirrigated):* 3e

*Typical Profile:*

H1—0 to 14 inches; clay loam  
H2—14 to 34 inches; clay  
H3—34 to 72 inches; sandy clay loam

**Minor Components**

**Oska**

*Composition:* About 5 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 3 to 6 percent  
*Depth to restrictive feature:* 20 to 40 inches  
to bedrock (lithic)  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe35-42)

**Morrill**

*Composition:* About 5 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 3 to 7 percent  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe30-37)

**Martin**

*Composition:* About 5 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 3 to 7 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Loamy Upland (pe35-42)

*Ecological site:* Clay Upland (pe30-37)

*Land capability (nonirrigated):* 3e

*Typical Profile:*

H1—0 to 14 inches; clay loam  
H2—14 to 34 inches; clay  
H3—34 to 72 inches; sandy clay loam

**Minor Components**

**Morrill**

*Phase:* Eroded  
*Composition:* About 5 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 3 to 7 percent  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe30-37)

**Martin**

*Phase:* Eroded  
*Composition:* About 5 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 3 to 7 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Loamy Upland (pe35-42)

**QUA—Quarries**

**Ph—Pawnee clay loam, 3 to 7 percent slopes, eroded**

**Map Unit Composition**

Pawnee: 90 percent  
Minor components: 10 percent

**Component Descriptions**

**Pawnee**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills  
*Landform:* Hillslope on upland  
*Hillslope position:* Backslope  
*Parent material:* Clayey drift  
*Slope:* 3 to 7 percent  
*Drainage class:* Moderately well drained  
*Slowest permeability:* Slow (About 0.06 in/hr)  
*Available water capacity:* Moderate (About 8.3 inches)  
*Shrink-swell potential:* High (About 7.5 LEP)  
*Flooding hazard:* None  
*Depth to seasonal water saturation:* About 9 to 14 inches  
*Runoff class:* High

**Re—Reading silt loam, 0 to 2 percent slopes, rarely flooded**

**Map Unit Composition**

Reading: 90 percent  
Minor components: 10 percent

**Component Descriptions**

**Reading**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills  
*Landform:* Terrace on river valley  
*Parent material:* Fine-silty alluvium  
*Slope:* 0 to 2 percent  
*Drainage class:* Well drained  
*Slowest permeability:* Moderately slow (About 0.20 in/hr)  
*Available water capacity:* High (About 11.5 inches)  
*Shrink-swell potential:* Moderate (About 4.5 LEP)  
*Flooding hazard:* Rare  
*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* Low

*Ecological site:* Loamy Lowland (pe35-42)

*Land capability (nonirrigated):* 1

*Typical Profile:*

H1—0 to 15 inches; silt loam

H2—15 to 41 inches; silty clay loam

H3—41 to 60 inches; silty clay

**Minor Components**

**Wabash**

*Composition:* About 5 percent

*Slope:* 0 to 1 percent

*Drainage class:* Poorly drained

*Ecological site:* Clay Lowland (pe30-37)

**Chase**

*Composition:* About 5 percent

*Slope:* 0 to 2 percent

*Drainage class:* Somewhat poorly drained

*Ecological site:* Loamy Lowland (pe35-42)

**Ro—Riverwash**

**Sa—Sand Pit**

**Sb—Sarpy-Eudora complex,  
overwash, occasionally flooded**

**Map Unit Composition**

Sarpy: 55 percent

Eudora: 45 percent

**Component Descriptions**

**Sarpy**

*MLRA:* -

*Landform:* Flood plain on river valley

*Parent material:* Sandy alluvium

*Slope:* 0 to 1 percent

*Drainage class:* Excessively drained

*Slowest permeability:* Rapid (About 5.95 in/hr)

*Available water capacity:* Low (About 4.1 inches)

*Shrink-swell potential:* Low (About 1.5 LEP)

*Flooding hazard:* Occasional

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* Negligible

*Ecological site:* Sandy Lowland (pe30-37)

*Land capability (nonirrigated):* 3w

*Typical Profile:*

H1—0 to 12 inches; loamy fine sand

H2—12 to 60 inches; fine sand

**Eudora**

*MLRA:* -

*Landform:* Flood plain on river valley

*Parent material:* Coarse-silty alluvium

*Slope:* 0 to 1 percent

*Drainage class:* Well drained

*Slowest permeability:* Moderate (About 0.60 in/hr)

*Available water capacity:* High (About 11.6 inches)

*Shrink-swell potential:* Low (About 1.5 LEP)

*Flooding hazard:* Occasional

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* Low

*Ecological site:* Loamy Lowland (pe30-37)

*Land capability (nonirrigated):* 3w

*Typical Profile:*

H1—0 to 8 inches; fine sandy loam

H2—8 to 60 inches; silt loam

**Sc—Sharpsburg silt loam, 1 to 4 percent slopes**

**Map Unit Composition**

Sharpsburg: 88 percent

Minor components: 12 percent

**Component Descriptions**

**Sharpsburg**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills

*Landform:* Hillslope on upland

*Hillslope position:* Summit

*Parent material:* Silty and clayey loess

*Slope:* 1 to 4 percent

*Drainage class:* Moderately well drained

*Slowest permeability:* Moderately slow (About 0.20 in/hr)

*Available water capacity:* High (About 11.6 inches)

*Shrink-swell potential:* High (About 7.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* Medium

*Ecological site:* Loamy Upland (pe30-37)

*Land capability (nonirrigated):* 2e

*Typical Profile:*

H1—0 to 12 inches; silt loam  
H2—12 to 27 inches; silty clay loam  
H3—27 to 36 inches; silty clay loam  
H4—36 to 60 inches; silty clay loam

**Minor Components**

**Gymer**

*Composition:* About 3 percent  
*Geomorphic Position:* terrace on river valley  
*Slope:* 3 to 8 percent  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe30-37)

**Morrill**

*Composition:* About 3 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 3 to 7 percent  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe30-37)

**Pawnee**

*Composition:* About 3 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 3 to 7 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Clay Upland (pe30-37)

**Woodson**

*Composition:* About 3 percent  
*Slope:* 0 to 1 percent  
*Drainage class:* Somewhat poorly drained  
*Ecological site:* Clay Upland (pe35-42)

**Sd—Sharpsburg silt loam, 4 to 10 percent slopes**

**Map Unit Composition**

Sharpsburg: 85 percent  
Minor components: 15 percent

**Component Descriptions**

**Sharpsburg**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills  
*Landform:* Hillslope on upland  
*Hillslope position:* Backslope  
*Parent material:* Silty and clayey loess  
*Slope:* 4 to 10 percent  
*Drainage class:* Moderately well drained  
*Slowest permeability:* Moderately slow (About 0.20 in/hr)

*Available water capacity:* High (About 11.6 inches)

*Shrink-swell potential:* High (About 7.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* High

*Ecological site:* Loamy Upland (pe30-37)

*Land capability (nonirrigated):* 3e

*Typical Profile:*

H1—0 to 12 inches; silt loam  
H2—12 to 27 inches; silty clay loam  
H3—27 to 36 inches; silty clay loam  
H4—36 to 60 inches; silty clay loam

**Minor Components**

**Gymer**

*Composition:* About 5 percent  
*Geomorphic Position:* terrace on river valley  
*Slope:* 3 to 8 percent  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe30-37)

**Morrill**

*Composition:* About 5 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 3 to 7 percent  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe30-37)

**Pawnee**

*Composition:* About 5 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 3 to 7 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Clay Upland (pe30-37)

**Sh—Sibleyville loam, 3 to 7 percent slopes**

**Map Unit Composition**

Sibleyville: 90 percent  
Minor components: 10 percent

**Component Descriptions**

**Sibleyville**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills, 112 - Cherokee Prairies  
*Landform:* Hillslope on upland  
*Parent material:* Sandy and silty residuum weathered from sandstone and shale  
*Slope:* 3 to 7 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Slowest permeability:* Moderate (About 0.60 in/hr)  
*Available water capacity:* Low (About 4.5 inches)  
*Shrink-swell potential:* Low (About 1.5 LEP)  
*Flooding hazard:* None  
*Depth to seasonal water saturation:* More than 6 feet  
*Runoff class:* Medium  
*Ecological site:* Loamy Upland (pe35-42)  
*Land capability (nonirrigated):* 3e

*Typical Profile:*

H1—0 to 7 inches; loam  
 H2—7 to 15 inches; loam  
 H3—15 to 27 inches; channery loam  
 Cr—27 to 31 inches; weathered bedrock

**Minor Components**

**Martin**

*Composition:* About 5 percent  
*Slope:* 7 to 11 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Loamy Upland (pe35-42)

**Woodson**

*Composition:* About 5 percent  
*Slope:* 0 to 1 percent  
*Drainage class:* Somewhat poorly drained  
*Ecological site:* Clay Upland (pe35-42)

**So—Sibleyville loam, 3 to 7 percent slopes, eroded**

**Map Unit Composition**

Sibleyville: 90 percent  
 Minor components: 10 percent

**Component Descriptions**

**Sibleyville**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills, 112 - Cherokee Prairies  
*Landform:* Hillslope on upland  
*Parent material:* Sandy and silty residuum weathered from sandstone and shale  
*Slope:* 3 to 7 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Slowest permeability:* Moderate (About 0.60 in/hr)  
*Available water capacity:* Low (About 4.5 inches)

*Shrink-swell potential:* Low (About 1.5 LEP)  
*Flooding hazard:* None  
*Depth to seasonal water saturation:* More than 6 feet  
*Runoff class:* Medium  
*Ecological site:* Loamy Upland (pe35-42)  
*Land capability (nonirrigated):* 4e

*Typical Profile:*

H1—0 to 7 inches; loam  
 H2—7 to 15 inches; loam  
 H3—15 to 27 inches; channery loam  
 Cr—27 to 31 inches;

**Minor Components**

**Martin**

*Composition:* About 5 percent  
*Slope:* 7 to 11 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Loamy Upland (pe35-42)

**Woodson**

*Composition:* About 5 percent  
*Slope:* 0 to 1 percent  
*Drainage class:* Somewhat poorly drained  
*Ecological site:* Clay Upland (pe35-42)

**Ss—Sibleyville complex, 3 to 7 percent slopes**

**Map Unit Composition**

Sibleyville: 60 percent  
 Minor components: 40 percent

**Component Descriptions**

**Sibleyville**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills, 112 - Cherokee Prairies  
*Landform:* Hillslope on upland  
*Parent material:* Sandy and silty residuum weathered from sandstone and shale  
*Slope:* 3 to 7 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Slowest permeability:* Moderate (About 0.60 in/hr)  
*Available water capacity:* Low (About 4.5 inches)  
*Shrink-swell potential:* Low (About 1.5 LEP)  
*Flooding hazard:* None  
*Depth to seasonal water saturation:* More than 6 feet  
*Runoff class:* Medium  
*Ecological site:* Loamy Upland (pe35-42)

*Land capability (nonirrigated): 4e*

*Typical Profile:*

H1—0 to 7 inches; loam  
H2—7 to 15 inches; loam  
H3—15 to 27 inches; channery loam  
Cr—27 to 31 inches; weathered bedrock

**Minor Components**

**Unnamed Series 1 - Shallow**

*Composition:* About 25 percent  
*Slope:* 3 to 7 percent  
*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe35-42)

**Unnamed Series 2 - Deep**

*Composition:* About 15 percent  
*Slope:* 3 to 7 percent  
*Depth to restrictive feature:* 40 to 60 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe35-42)

**Vinland**

*Slope:* 7 to 15 percent  
*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)  
*Drainage class:* Somewhat excessively drained  
*Ecological site:* Loamy Upland (pe35-42)

**Martin**

*Slope:* 7 to 11 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Loamy Upland (pe35-42)

**Woodson**

*Slope:* 0 to 1 percent  
*Drainage class:* Somewhat poorly drained  
*Ecological site:* Clay Upland (pe35-42)

**Basehor**

*Slope:* 7 to 15 percent  
*Depth to restrictive feature:* 8 to 20 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Ecological site:* Shallow Savannah (pe30-37)

**St—Sibleyville complex, 3 to 7 percent slopes, eroded**

**Map Unit Composition**

Sibleyville: 50 percent  
Minor components: 50 percent

**Component Descriptions**

**Sibleyville**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills, 112 - Cherokee Prairies

*Landform:* Hillslope on upland

*Parent material:* Sandy and silty residuum weathered from sandstone and shale

*Slope:* 3 to 7 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Slowest permeability:* Moderate (About 0.60 in/hr)

*Available water capacity:* Low (About 4.5 inches)

*Shrink-swell potential:* Low (About 1.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* Medium

*Ecological site:* Loamy Upland (pe35-42)

*Land capability (nonirrigated): 4e*

*Typical Profile:*

H1—0 to 7 inches; loam  
H2—7 to 15 inches; loam  
H3—15 to 27 inches; channery loam  
Cr—27 to 31 inches; weathered bedrock

**Minor Components**

**Unnamed Series 1 - Shallow**

*Composition:* About 40 percent  
*Slope:* 3 to 7 percent  
*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe35-42)

**Unnamed Series 2 - Deep**

*Composition:* About 8 percent  
*Slope:* 3 to 7 percent  
*Depth to restrictive feature:* 40 to 60 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe35-42)

**Vinland**

*Composition:* About 1 percent  
*Slope:* 7 to 15 percent  
*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)  
*Drainage class:* Somewhat excessively drained  
*Ecological site:* Loamy Upland (pe35-42)

**Martin**

*Composition:* About 1 percent  
*Slope:* 7 to 11 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Loamy Upland (pe35-42)

## **SU—Summit silty clay loam, 3 to 7 percent slopes**

### **Map Unit Composition**

Summit: 90 percent  
Minor components: 10 percent

### **Component Descriptions**

#### **Summit**

*MLRA:* 112 - Cherokee Prairies  
*Landform:* Hillslope on upland  
*Hillslope position:* Backslope  
*Parent material:* Silty and clayey residuum weathered from calcareous shale  
*Slope:* 3 to 7 percent  
*Drainage class:* Moderately well drained  
*Slowest permeability:* Slow (About 0.06 in/hr)  
*Available water capacity:* Moderate (About 8.6 inches)  
*Shrink-swell potential:* High (About 7.5 LEP)  
*Flooding hazard:* None  
*Depth to seasonal water saturation:* About 21 to 26 inches  
*Runoff class:* High  
*Ecological site:* Loamy Upland (pe35-42)  
*Land capability (nonirrigated):* 3e

#### *Typical Profile:*

A—0 to 8 inches; silty clay loam  
AB—8 to 13 inches; silty clay loam  
Bt—13 to 60 inches; silty clay

#### **Minor Components**

##### **Clareson**

*Composition:* About 5 percent  
*Slope:* 3 to 15 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Ecological site:* Shallow Flats (pe35-42)

##### **Lebo**

*Composition:* About 3 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 8 to 12 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe35-42)

##### **Lula**

*Composition:* About 2 percent  
*Slope:* 3 to 5 percent

*Depth to restrictive feature:* 40 to 60 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe35-42)

## **Sv—Sibleyville complex, 7 to 15 percent slopes**

### **Map Unit Composition**

Sibleyville: 50 percent  
Minor components: 50 percent

### **Component Descriptions**

#### **Sibleyville**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills, 112 - Cherokee Prairies  
*Landform:* Hillslope on upland  
*Parent material:* Sandy and silty residuum weathered from sandstone and shale  
*Slope:* 7 to 15 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Slowest permeability:* Moderate (About 0.60 in/hr)  
*Available water capacity:* Low (About 4.5 inches)  
*Shrink-swell potential:* Low (About 1.5 LEP)  
*Flooding hazard:* None  
*Depth to seasonal water saturation:* More than 6 feet  
*Runoff class:* Medium  
*Ecological site:* Loamy Upland (pe35-42)  
*Land capability (nonirrigated):* 6e

#### *Typical Profile:*

H1—0 to 7 inches; loam  
H2—7 to 15 inches; loam  
H3—15 to 27 inches; channery loam  
Cr—27 to 31 inches; weathered bedrock

#### **Minor Components**

##### **Unnamed Series 1 - Shallow**

*Composition:* About 25 percent  
*Slope:* 3 to 7 percent  
*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe35-42)

##### **Unnamed Series 2 - Deep**

*Composition:* About 15 percent  
*Slope:* 3 to 7 percent  
*Depth to restrictive feature:* 40 to 60 inches to bedrock (paralithic)



*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe35-42)

#### **Vinland**

*Composition:* About 4 percent  
*Slope:* 7 to 15 percent  
*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)  
*Drainage class:* Somewhat excessively drained  
*Ecological site:* Loamy Upland (pe35-42)

#### **Gymer**

*Composition:* About 3 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 3 to 8 percent  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe30-37)

#### **Martin**

*Composition:* About 3 percent  
*Slope:* 7 to 11 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Loamy Upland (pe35-42)

### **SVV—Sibleyville-Vinland loams, 3 to 7 percent slopes**

#### **Map Unit Composition**

Sibleyville: 45 percent  
 Vinland: 35 percent  
 Minor components: 20 percent

#### **Component Descriptions**

##### **Sibleyville**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills, 112 - Cherokee Prairies  
*Landform:* Hillslope on upland  
*Parent material:* Sandy and silty residuum weathered from sandstone and shale  
*Slope:* 3 to 7 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Slowest permeability:* Moderate (About 0.60 in/hr)  
*Available water capacity:* Low (About 5.1 inches)  
*Shrink-swell potential:* Low (About 1.5 LEP)  
*Flooding hazard:* None  
*Depth to seasonal water saturation:* More than 6 feet  
*Runoff class:* Medium  
*Ecological site:* Loamy Upland (pe35-42)  
*Land capability (nonirrigated):* 4e

##### *Typical Profile:*

H1—0 to 8 inches; loam  
 H2—8 to 22 inches; loam  
 H3—22 to 29 inches; channery loam  
 Cr—29 to 33 inches; weathered bedrock

#### **Vinland**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills, 112 - Cherokee Prairies  
*Landform:* Hillslope on upland  
*Parent material:* Sandy and silty residuum weathered from shale  
*Slope:* 3 to 7 percent  
*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)  
*Drainage class:* Somewhat excessively drained  
*Slowest permeability:* Moderate (About 0.60 in/hr)  
*Available water capacity:* Low (About 4.2 inches)  
*Shrink-swell potential:* Low (About 1.5 LEP)  
*Flooding hazard:* None  
*Depth to seasonal water saturation:* More than 6 feet  
*Runoff class:* Medium  
*Ecological site:* Loamy Upland (pe35-42)

##### *Typical Profile:*

H1—0 to 18 inches; loam  
 Cr—18 to 22 inches; weathered bedrock

#### **Minor Components**

##### **Martin**

*Composition:* About 10 percent  
*Slope:* 2 to 5 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Loamy Upland (pe35-42)

##### **Sogn**

*Composition:* About 10 percent  
*Slope:* 7 to 15 percent  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Somewhat excessively drained  
*Ecological site:* Shallow Limy (pe30-37)

### **Sw—Sogn-Vinland complex, 5 to 20 percent slopes**

#### **Map Unit Composition**

Sogn: 55 percent  
 Vinland: 30 percent  
 Minor components: 15 percent

## Component Descriptions

### Sogn

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills, 112 - Cherokee Prairies

*Landform:* Hillslope on upland

*Parent material:* Loamy residuum weathered from limestone

*Slope:* 5 to 20 percent

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* Moderate (About 0.60 in/hr)

*Available water capacity:* Very low (About 2.4 inches)

*Shrink-swell potential:* Moderate (About 4.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* Medium

*Ecological site:* Shallow Limy (pe35-42)

*Land capability (nonirrigated):* 7s

#### Typical Profile:

H1—0 to 12 inches; silty clay loam

H2—12 to 16 inches; unweathered bedrock

### Vinland

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills, 112 - Cherokee Prairies

*Landform:* Hillslope on upland

*Parent material:* Loamy residuum weathered from shale

*Slope:* 7 to 15 percent

*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* Moderate (About 0.60 in/hr)

*Available water capacity:* Low (About 3.5 inches)

*Shrink-swell potential:* Moderate (About 4.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* Medium

*Ecological site:* Loamy Upland (pe35-42)

*Land capability (nonirrigated):* 6e

#### Typical Profile:

H1—0 to 7 inches; silty clay loam

H2—7 to 17 inches; silty clay loam

Cr—17 to 21 inches; weathered bedrock

## Minor Components

### Martin

*Composition:* About 5 percent

*Slope:* 3 to 7 percent

*Drainage class:* Moderately well drained

*Ecological site:* Loamy Upland (pe35-42)

### Oska

*Composition:* About 5 percent

*Slope:* 3 to 6 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)

*Drainage class:* Well drained

*Ecological site:* Loamy Upland (pe35-42)

### Sibleyville

*Composition:* About 5 percent

*Slope:* 7 to 15 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Ecological site:* Loamy Upland (pe35-42)

## Sx—Vinland-Rock outcrop complex, 20 to 40 percent slopes

## Map Unit Composition

Rock outcrop: 60 percent

Vinland: 26 percent

Minor components: 14 percent

## Component Descriptions

### Rock outcrop

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills, 112 - Cherokee Prairies

*Landform:* Hillslope on upland

*Slope:* 20 to 40 percent

*Depth to restrictive feature:* 0 inches to bedrock (lithic)

*Drainage class:* Excessively drained

*Flooding hazard:* None

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* Very high

*Land capability (nonirrigated):* 8

### Vinland

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills, 112 - Cherokee Prairies

*Landform:* Hillslope on upland

*Parent material:* Sandy and silty residuum weathered from shale

*Slope:* 20 to 30 percent

*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)  
*Drainage class:* Somewhat excessively drained  
*Slowest permeability:* Moderate (About 0.60 in/hr)  
*Available water capacity:* Low (About 3.5 inches)  
*Shrink-swell potential:* Moderate (About 4.5 LEP)  
*Flooding hazard:* None  
*Depth to seasonal water saturation:* More than 6 feet  
*Runoff class:* High  
*Ecological site:* Loamy Upland (pe35-42)  
*Land capability (nonirrigated):* 6e

*Typical Profile:*

H1—0 to 7 inches; silty clay loam  
 H2—7 to 17 inches; silty clay loam  
 Cr—17 to 21 inches; weathered bedrock

**Minor Components**

**Sogn**

*Composition:* About 10 percent  
*Slope:* 15 to 20 percent  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Somewhat excessively drained  
*Ecological site:* Shallow Limy (pe30-37)

**Martin**

*Composition:* About 2 percent  
*Slope:* 7 to 11 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Loamy Upland (pe35-42)

**Oska**

*Composition:* About 2 percent  
*Slope:* 3 to 6 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe35-42)

**Tc—Thurman complex, 4 to 10 percent slopes**

**Map Unit Composition**

Thurman: 35 percent  
 Minor components: 65 percent

**Component Descriptions**

**Thurman**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills  
*Landform:* Hillslope on upland

*Parent material:* Sandy eolian sands  
*Slope:* 4 to 10 percent  
*Drainage class:* Excessively drained  
*Slowest permeability:* Rapid (About 5.95 in/hr)  
*Available water capacity:* Low (About 4.9 inches)  
*Shrink-swell potential:* Low (About 1.5 LEP)  
*Flooding hazard:* None  
*Depth to seasonal water saturation:* More than 6 feet  
*Runoff class:* Very low  
*Ecological site:* Savannah (pe30-37)  
*Land capability (nonirrigated):* 4e

*Typical Profile:*

H1—0 to 22 inches; loamy sand  
 H2—22 to 32 inches; loamy fine sand  
 H3—32 to 60 inches; fine sand

**Minor Components**

**Unnamed Series - Coarse-Loamy**

*Composition:* About 30 percent  
*Slope:* 4 to 10 percent  
*Drainage class:* Somewhat excessively drained  
*Ecological site:* Savannah (pe30-37)

**Unnamed Series - Fine-Loamy**

*Composition:* About 25 percent  
*Slope:* 4 to 10 percent  
*Drainage class:* Well drained  
*Ecological site:* Savannah (pe30-37)

**Morrill**

*Composition:* About 4 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 3 to 7 percent  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe30-37)

**Sharpsburg**

*Composition:* About 3 percent  
*Geomorphic Position:* hillslope on upland  
*Slope:* 1 to 4 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Loamy Upland (pe30-37)

**Gymer**

*Composition:* About 3 percent  
*Geomorphic Position:* terrace on river valley  
*Slope:* 3 to 8 percent  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe30-37)

**VA—Verdigris silt loam, channeled**

*Depth to restrictive feature:* 0 inches to bedrock (lithic)

**Map Unit Composition**

Verdigris: 88 percent  
Minor components: 12 percent

**Component Descriptions****Verdigris**

*MLRA:* 112 - Cherokee Prairies  
*Landform:* Flood plain on valley  
*Parent material:* Silty alluvium  
*Slope:* 0 to 2 percent  
*Drainage class:* Well drained  
*Slowest permeability:* Moderate (About 0.60 in/hr)  
*Available water capacity:* High (About 12.0 inches)  
*Shrink-swell potential:* Moderate (About 4.5 LEP)  
*Flooding hazard:* Frequent  
*Depth to seasonal water saturation:* More than 6 feet  
*Runoff class:* Low  
*Ecological site:* Loamy Lowland (pe35-42)  
*Land capability (nonirrigated):* 5w

*Typical Profile:*

A—0 to 7 inches; silt loam  
Bw—7 to 60 inches; silt loam

**Minor Components****Bates**

*Composition:* About 3 percent  
*Slope:* 3 to 7 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe35-42)

**Eram**

*Composition:* About 3 percent  
*Geomorphic Position:* hillside on upland  
*Slope:* 3 to 7 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Moderately well drained  
*Ecological site:* Clay Upland (pe35-42)

**Osage**

*Composition:* About 3 percent  
*Slope:* 0 to 1 percent  
*Drainage class:* Poorly drained  
*Ecological site:* Clay Lowland (pe35-42)

**Rock outcrop**

*Composition:* About 3 percent  
*Slope:* 20 to 40 percent

**Vc—Vinland complex, 3 to 7 percent slopes****Map Unit Composition**

Vinland: 50 percent  
Minor components: 50 percent

**Component Descriptions****Vinland**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills  
*Landform:* Hillslope on upland  
*Parent material:* Sandy and silty residuum weathered from shale  
*Slope:* 3 to 7 percent  
*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)  
*Drainage class:* Somewhat excessively drained  
*Slowest permeability:* Moderate (About 0.60 in/hr)  
*Available water capacity:* Low (About 3.5 inches)  
*Shrink-swell potential:* Moderate (About 4.5 LEP)  
*Flooding hazard:* None  
*Depth to seasonal water saturation:* More than 6 feet  
*Runoff class:* Medium  
*Ecological site:* Loamy Upland (pe30-37)  
*Land capability (nonirrigated):* 6e

*Typical Profile:*

H1—0 to 12 inches; silty clay loam  
H2—12 to 16 inches; silty clay loam  
Cr—16 to 20 inches; weathered bedrock

**Minor Components****Vinland**

*Composition:* About 30 percent  
*Slope:* 3 to 7 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe30-37)

**Martin**

*Composition:* About 10 percent  
*Slope:* 3 to 8 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Loamy Upland (pe30-37)

**Sibleyville**

*Composition:* About 2 percent  
*Slope:* 3 to 7 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe35-42)

**Shelby**

*Composition:* About 2 percent  
*Slope:* 3 to 8 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Loamy Upland (pe30-37)

**Pawnee**

*Composition:* About 2 percent  
*Slope:* 3 to 8 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Clay Upland (pe30-37)

**Sogn**

*Composition:* About 2 percent  
*Slope:* 5 to 20 percent  
*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)  
*Drainage class:* Somewhat excessively drained  
*Ecological site:* Shallow Limy (pe30-37)

**Oska**

*Composition:* About 2 percent  
*Slope:* 2 to 6 percent  
*Depth to restrictive feature:* 20 to 40 inches to bedrock (lithic)  
*Drainage class:* Well drained  
*Ecological site:* Loamy Upland (pe30-37)

**Vh—Vinland complex, 3 to 7 percent slopes, eroded****Map Unit Composition**

Vinland: 60 percent  
 Minor components: 40 percent

**Component Descriptions****Vinland**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills, 112 - Cherokee Prairies  
*Landform:* Hillslope on upland  
*Parent material:* Sandy and silty residuum weathered from shale  
*Slope:* 3 to 7 percent  
*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)  
*Drainage class:* Somewhat excessively drained

*Slowest permeability:* Moderate (About 0.60 in/hr)

*Available water capacity:* Low (About 3.5 inches)

*Shrink-swell potential:* Moderate (About 4.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* Medium

*Ecological site:* Loamy Upland (pe35-42)

*Land capability (nonirrigated):* 6e

**Typical Profile:**

H1—0 to 7 inches; silty clay loam

H2—7 to 17 inches; silty clay loam

Cr—17 to 21 inches; weathered bedrock

**Minor Components****Unnamed Soil**

*Composition:* About 30 percent

*Slope:* 3 to 7 percent

*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)

*Drainage class:* Somewhat excessively drained

*Ecological site:* Loamy Upland (pe35-42)

**Sogn**

*Composition:* About 4 percent

*Slope:* 7 to 15 percent

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Somewhat excessively drained

*Ecological site:* Shallow Limy (pe30-37)

**Martin**

*Composition:* About 3 percent

*Slope:* 7 to 11 percent

*Drainage class:* Moderately well drained

*Ecological site:* Loamy Upland (pe35-42)

**Sibleyville**

*Composition:* About 3 percent

*Slope:* 3 to 7 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Ecological site:* Loamy Upland (pe35-42)

**Vm—Vinland-Martin complex, 7 to 15 percent slopes****Map Unit Composition**

Vinland: 40 percent

Martin: 25 percent

Minor components: 35 percent

### Component Descriptions

#### Vinland

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills, 112 - Cherokee Prairies

*Landform:* Hillslope on upland

*Parent material:* Sandy and silty residuum weathered from shale

*Slope:* 7 to 15 percent

*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)

*Drainage class:* Somewhat excessively drained

*Slowest permeability:* Moderate (About 0.60 in/hr)

*Available water capacity:* Low (About 3.5 inches)

*Shrink-swell potential:* Moderate (About 4.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* More than 6 feet

*Runoff class:* Medium

*Ecological site:* Loamy Upland (pe35-42)

*Land capability (nonirrigated):* 6e

#### Typical Profile:

H1—0 to 7 inches; silty clay loam

H2—7 to 17 inches; silty clay loam

Cr—17 to 21 inches; weathered bedrock

#### Martin

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills, 112 - Cherokee Prairies

*Landform:* Hillslope on upland

*Parent material:* Silty and clayey colluvium derived from limestone and shale over silty and

clayey residuum weathered from limestone and shale

*Slope:* 7 to 11 percent

*Drainage class:* Moderately well drained

*Slowest permeability:* Slow (About 0.06 in/hr)

*Available water capacity:* High (About 9.7 inches)

*Shrink-swell potential:* High (About 7.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* About 22 to 26 inches

*Runoff class:* Very high

*Ecological site:* Loamy Upland (pe35-42)

*Land capability (nonirrigated):* 4e

#### Typical Profile:

H1—0 to 9 inches; silty clay loam

H2—9 to 14 inches; silty clay loam

H3—14 to 60 inches; silty clay

### Minor Components

#### Unnamed Soil

*Composition:* About 20 percent

*Slope:* 3 to 7 percent

*Depth to restrictive feature:* 10 to 20 inches to bedrock (paralithic)

*Drainage class:* Somewhat excessively drained

*Ecological site:* Loamy Upland (pe35-42)

#### Sibleyville

*Composition:* About 8 percent

*Slope:* 7 to 15 percent

*Depth to restrictive feature:* 20 to 40 inches to bedrock (paralithic)

*Drainage class:* Well drained

*Ecological site:* Loamy Upland (pe35-42)

#### Sogn

*Composition:* About 7 percent

*Slope:* 7 to 15 percent

*Depth to restrictive feature:* 4 to 20 inches to bedrock (lithic)

*Drainage class:* Somewhat excessively drained

*Ecological site:* Shallow Limy (pe30-37)

### W—Water (less Than 40 Acres In Size)

### Wc—Wabash silty clay loam, occasionally flooded

### Map Unit Composition

Wabash: 88 percent

Minor components: 12 percent

### Component Descriptions

#### Wabash

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills

*Landform:* Terrace on river valley

*Parent material:* Clayey alluvium

*Slope:* 0 to 1 percent

*Drainage class:* Poorly drained

*Slowest permeability:* Very slow (About 0.00 in/hr)

*Available water capacity:* Moderate (About 8.0 inches)

*Shrink-swell potential:* Very high (About 17.0 LEP)

*Flooding hazard:* Occasional

*Depth to seasonal water saturation:* About 2 to 9 inches

*Runoff class:* Very high

*Ecological site:* Clay Lowland (pe30-37)

*Land capability (nonirrigated):* 3w

*Typical Profile:*

H1—0 to 16 inches; silty clay loam

H2—16 to 70 inches; silty clay

**Minor Components**

**Kennebec**

*Composition:* About 3 percent

*Slope:* 0 to 2 percent

*Drainage class:* Moderately well drained

*Ecological site:* Loamy Lowland (pe30-37)

**Reading**

*Composition:* About 3 percent

*Slope:* 0 to 2 percent

*Drainage class:* Well drained

*Ecological site:* Loamy Lowland (pe35-42)

**Wabash**

*Composition:* About 3 percent

*Slope:* 0 to 1 percent

*Drainage class:* Poorly drained

*Ecological site:* Clay Lowland (pe30-37)

**Leanna**

*Composition:* About 3 percent

*Geomorphic Position:* flood plain on valley

*Slope:* 0 to 2 percent

*Drainage class:* Somewhat poorly drained

*Ecological site:* Clay Lowland (pe35-42)

**Wh—Wabash silty clay,  
occasionally flooded**

**Map Unit Composition**

Wabash: 90 percent

Minor components: 10 percent

**Component Descriptions**

**Wabash**

*MLRA:* 106 - Nebraska and Kansas Loess-Drift Hills

*Landform:* Terrace on river valley

*Parent material:* Clayey alluvium

*Slope:* 0 to 1 percent

*Drainage class:* Poorly drained

*Slowest permeability:* Very slow (About 0.00 in/hr)

*Available water capacity:* Moderate (About 6.4 inches)

*Shrink-swell potential:* Very high (About 17.0 LEP)

*Flooding hazard:* Occasional

*Depth to seasonal water saturation:* About 2 to 9 inches

*Runoff class:* Very high

*Ecological site:* Clay Lowland (pe30-37)

*Land capability (nonirrigated):* 3w

*Typical Profile:*

H1—0 to 16 inches; silty clay

H2—16 to 70 inches; silty clay

**Minor Components**

**Reading**

*Composition:* About 5 percent

*Slope:* 0 to 2 percent

*Drainage class:* Well drained

*Ecological site:* Loamy Lowland (pe35-42)

**Wabash**

*Composition:* About 5 percent

*Slope:* 0 to 1 percent

*Drainage class:* Poorly drained

*Ecological site:* Clay Lowland (pe30-37)

**Wo—Woodson silt loam, 0 to 1  
percent slopes**

**Map Unit Composition**

Woodson: 90 percent

Minor components: 10 percent

**Component Descriptions**

**Woodson**

*MLRA:* 112 - Cherokee Prairies

*Landform:* Divide on upland

*Parent material:* Silty and clayey alluvium over silty and clayey residuum weathered from clayey

shale

*Slope:* 0 to 1 percent

*Drainage class:* Somewhat poorly drained

*Slowest permeability:* Very slow (About 0.00 in/hr)

*Available water capacity:* High (About 9.1 inches)

*Shrink-swell potential:* High (About 7.5 LEP)

*Flooding hazard:* None

*Depth to seasonal water saturation:* About 4 to 9 inches

*Runoff class:* Very high  
*Ecological site:* Clay Upland (pe35-42)  
*Land capability (nonirrigated):* 2s

*Typical Profile:*  
 H1—0 to 11 inches; silt loam  
 H2—11 to 45 inches; silty clay  
 H3—45 to 78 inches; silty clay loam

#### **Minor Components**

##### **Martin**

*Composition:* About 5 percent  
*Slope:* 1 to 3 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Loamy Upland (pe35-42)

##### **Pawnee**

*Composition:* About 5 percent  
*Slope:* 1 to 3 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Clay Upland (pe30-37)

#### *Typical Profile:*

H1—0 to 11 inches; silt loam  
 H2—11 to 45 inches; silty clay  
 H3—45 to 78 inches; silty clay loam

#### **Minor Components**

##### **Martin**

*Composition:* About 5 percent  
*Slope:* 3 to 7 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Loamy Upland (pe35-42)

##### **Pawnee**

*Composition:* About 5 percent  
*Slope:* 3 to 7 percent  
*Drainage class:* Moderately well drained  
*Ecological site:* Clay Upland (pe30-37)

### **Wx—Woodson silty clay loam, 1 to 3 percent slopes, eroded**

### **Ws—Woodson silt loam, 1 to 3 percent slopes**

#### **Map Unit Composition**

Woodson: 90 percent  
 Minor components: 10 percent

#### **Component Descriptions**

##### **Woodson**

*MLRA:* 112 - Cherokee Prairies  
*Landform:* Divide on upland  
*Parent material:* Silty and clayey alluvium over silty and clayey residuum weathered from clayey shale  
*Slope:* 1 to 3 percent  
*Drainage class:* Somewhat poorly drained  
*Slowest permeability:* Very slow (About 0.00 in/hr)  
*Available water capacity:* High (About 9.1 inches)  
*Shrink-swell potential:* High (About 7.5 LEP)  
*Flooding hazard:* None  
*Depth to seasonal water saturation:* About 4 to 9 inches  
*Runoff class:* Very high  
*Ecological site:* Clay Upland (pe35-42)  
*Land capability (nonirrigated):* 3e

#### **Map Unit Composition**

Woodson: 90 percent  
 Minor components: 10 percent

#### **Component Descriptions**

##### **Woodson**

*MLRA:* 112 - Cherokee Prairies  
*Landform:* Divide on upland  
*Parent material:* Silty and clayey alluvium over silty and clayey residuum weathered from clayey shale  
*Slope:* 1 to 3 percent  
*Drainage class:* Somewhat poorly drained  
*Slowest permeability:* Very slow (About 0.00 in/hr)  
*Available water capacity:* Moderate (About 8.8 inches)  
*Shrink-swell potential:* High (About 7.5 LEP)  
*Flooding hazard:* None  
*Depth to seasonal water saturation:* About 4 to 9 inches  
*Runoff class:* Very high  
*Ecological site:* Clay Upland (pe35-42)  
*Land capability (nonirrigated):* 4e

#### *Typical Profile:*

H1—0 to 8 inches; silty clay loam  
 H2—8 to 45 inches; silty clay  
 H3—45 to 78 inches; silty clay



**Minor Components****Sibleyville***Phase:* Eroded*Composition:* About 5 percent*Slope:* 3 to 7 percent*Depth to restrictive feature:* 20 to 40 inches  
to bedrock (paralithic)*Drainage class:* Well drained*Ecological site:* Loamy Upland (pe35-42)**Martin***Composition:* About 5 percent*Slope:* 7 to 11 percent*Drainage class:* Moderately well drained*Ecological site:* Loamy Upland (pe35-42)

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

A recent trend in land use in some parts of the survey area has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

The map units in the survey area that are considered prime farmland are listed in the following table. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is shown in the "Acres and Proportionate Extent of Soils" table. The location is shown on the detailed soil maps. The soil qualities that affect use and management are described in other tables in this document."

Map symbol	Mapunit name	Farmland Classification
059BC	Bates loam, 1 to 4 percent slopes	All areas are prime farmland
059DN	Dennis-bates complex, 2 to 6 percent slopes	All areas are prime farmland
059MB	Mason silt loam, 0 to 2 percent slopes, rarely flooded	All areas are prime farmland
059VB	Verdigris silt loam, 0 to 2 percent slopes, occasionally flooded	All areas are prime farmland
091EB	Eudora soils, overwash, rarely flooded	All areas are prime farmland
091MC	Morrill loam, 3 to 8 percent slopes	All areas are prime farmland
139ED	Elmont loam, 3 to 7 percent slopes	All areas are prime farmland
139LU	Lula silt loam, 1 to 3 percent slopes	All areas are prime farmland
2326	Kenoma silt loam, 1 to 4 percent slopes	All areas are prime farmland
3494	Summit silty clay loam, 1 to 4 percent slopes	All areas are prime farmland
3951	Woodson silt loam, 1 to 3 percent slopes	All areas are prime farmland
Et	Eudora silt loam, rarely flooded	All areas are prime farmland
Ev	Eudora-kimo complex, rarely flooded	All areas are prime farmland
Ew	Eudora-kimo fine sandy loams, rarely flooded, overwash	All areas are prime farmland
Gm	Gymer silt loam, 1 to 3 percent slopes	All areas are prime farmland
Gy	Gymer silt loam, 3 to 8 percent slopes	All areas are prime farmland
Ju	Judson silt loam, rarely flooded	All areas are prime farmland
Kb	Kennebec silt loam, occasionally flooded	All areas are prime farmland
Km	Kimo silty clay loam, rarely flooded	All areas are prime farmland
Mb	Martin silty clay loam, 1 to 3 percent slopes	All areas are prime farmland
Mc	Martin silty clay loam, 3 to 7 percent slopes	All areas are prime farmland
Mr	Morrill clay loam, 3 to 7 percent slopes	All areas are prime farmland
Pb	Pawnee clay loam, 1 to 3 percent slopes	All areas are prime farmland
Re	Reading silt loam, 0 to 2 percent slopes, rarely flooded	All areas are prime farmland
Sc	Sharpsburg silt loam, 1 to 4 percent slopes	All areas are prime farmland
Sh	Sibleyville loam, 3 to 7 percent slopes	All areas are prime farmland
SU	Summit silty clay loam, 3 to 7 percent slopes	All areas are prime farmland
Wo	Woodson silt loam, 0 to 1 percent slopes	All areas are prime farmland
Ws	Woodson silt loam, 1 to 3 percent slopes	All areas are prime farmland
Wx	Woodson silty clay loam, 1 to 3 percent slopes, eroded	All areas are prime farmland
059OS	Osage silty clay loam, 0 to 2 percent slopes, occasionally flooded	Prime farmland if drained
2540	Leanna silt loam, 0 to 2 percent slopes, occasionally flooded	Prime farmland if drained
Le	Leanna silt loam, 0 to 2 percent slopes, occasionally flooded	Prime farmland if drained
Wc	Wabash silty clay loam, occasionally flooded	Prime farmland if drained
Wh	Wabash silty clay, occasionally flooded	Prime farmland if drained

The "Soil Rating for Plant Growth, modified 1998" (SRPG) is a relative rating of the capacity of a soil to produce a specific plant under a defined management system. The index is determined from yield data on a few benchmark soils and is used to calculate yields, the net returns from crops, land assessment values, and taxes and to perform risk analysis when land management decisions are made. Specific information on plants and yields can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Map symbol	Soil name	Crop Index
059BC	Bates Loam, 1 To 4 Percent Slopes-----	56
059BD	Bates-Collinsville Loams, 3 To 7 Percent Slopes-----	54
059BH	Bates-Collinsville Loams, 7 To 12 Percent Slopes-----	41
059BS	Bolivar-Hector Loams, 6 To 12 Percent Slopes-----	34
059CM	Clareson-Eram Silty Clay Loams, 3 To 15 Percent Slopes-----	39
059DN	Dennis-Bates Complex, 2 To 6 Percent Slopes-----	68
059EA	Eram-Lebo Silty Clay Loams, 7 To 12 Percent Slopes-----	50
059EC	Eram-Lula Complex, 3 To 7 Percent Slopes-----	65
059LN	Lebo-Rock Outcrop Complex, 20 To 40 Percent Slopes-----	7
059MB	Mason Silt Loam, 0 To 2 Percent Slopes, Rarely Flooded-----	84
059OS	Osage Silty Clay Loam, 0 To 2 Percent Slopes, Occasionally Flooded-----	65
059VB	Verdigris Silt Loam, 0 To 2 Percent Slopes, Occasionally Flooded-----	81
087EC	Eudora-Bismarckgrove Complex, 0 To 3 Percent Slopes, Overwash, Occasionally Flooded-----	75
087FU	Fluvaquents-----	46
087MU	Muscotah Silty Clay Loam, 0 To 1 Percent Slopes, Very Rarely Flooded-----	78
091EB	Eudora Soils, Overwash, Rarely Flooded-----	78
091MC	Morrill Loam, 3 To 8 Percent Slopes-----	81
139CM	Clareson-Eram Complex, 3 To 15 Percent Slopes-----	27
139ED	Elmont Loam, 3 To 7 Percent Slopes-----	77
139LU	Lula Silt Loam, 1 To 3 Percent Slopes-----	76
177MF	Martin Silty Clay Loam, 7 To 11 Percent Slopes-----	70
177SW	Vinland-Rock Outcrop Complex, 15 To 45 Percent Slopes-----	9
2326	Kenoma Silt Loam, 1 To 4 Percent Slopes-----	63
2540	Leanna Silt Loam, 0 To 2 Percent Slopes, Occasionally Flooded-----	72
2797	Morrill-Gravelly Loam, 4 To 20 Percent Slopes, Stony-----	17
3460	Sibleyville-Vinland Complex, 7 To 15 Percent Slopes-----	32
3461	Sibleyville Loam, 3 To 7 Percent Slopes, Eroded-----	44
3462	Sibleyville Loam, 3 To 7 Percent Slopes-----	45
3464	Sibleyville-Vinland Loams, 3 To 7 Percent Slopes-----	36
3494	Summit Silty Clay Loam, 1 To 4 Percent Slopes-----	71
3495	Summit Silty Clay Loam, 4 To 8 Percent Slopes-----	66
3815	Verdigris Silt Loam, 0 To 2 Percent Slopes, Frequently Flooded-----	64
3926	Water-----	0
3951	Woodson Silt Loam, 1 To 3 Percent Slopes-----	73
601KW	Konawa Fine Sandy Loam, 8 To 20 Percent Slopes-----	57
601SA	Sarpy-Haynie Complex, 0 To 3 Percent Slopes, Occasionally Flooded-----	37
AED	Arents, Earthen Dam-----	0
BOP	Borrow Pits-----	0
Be	Basehor Complex, 7 To 15 Percent Slopes-----	27
Et	Eudora Silt Loam, Rarely Flooded-----	75
Ev	Eudora-Kimo Complex, Rarely Flooded-----	73
Ew	Eudora-Kimo Fine Sandy Loams, Rarely Flooded, Overwash-----	71
Gm	Gymer Silt Loam, 1 To 3 Percent Slopes-----	84
Gy	Gymer Silt Loam, 3 To 8 Percent Slopes-----	80
Ju	Judson Silt Loam, Rarely Flooded-----	86
KA	Kennebec Silt Loam, Channeled-----	64
Kb	Kennebec Silt Loam, Occasionally Flooded-----	80
Kc	Kennebec Soils, Channeled-----	61
Km	Kimo Silty Clay Loam, Rarely Flooded-----	74
Le	Leanna Silt Loam, 0 To 2 Percent Slopes, Occasionally Flooded-----	72
M-W	Miscellaneous Water-----	0
Mb	Martin Silty Clay Loam, 1 To 3 Percent Slopes-----	81
Mc	Martin Silty Clay Loam, 3 To 7 Percent Slopes-----	74
Mh	Martin Soils, 3 To 7 Percent Slopes, Eroded-----	70
Mo	Martin-Oska Silty Clay Loams, 3 To 6 Percent Slopes-----	65
Mr	Morrill Clay Loam, 3 To 7 Percent Slopes-----	80
Ms	Morrill Clay Loam, 7 To 12 Percent Slopes-----	72
Oe	Oska Silty Clay Loam, 3 To 6 Percent Slopes-----	65
Pb	Pawnee Clay Loam, 1 To 3 Percent Slopes-----	71
Pc	Pawnee Clay Loam, 3 To 7 Percent Slopes-----	69
Ph	Pawnee Clay Loam, 3 To 7 Percent Slopes, Eroded-----	69
QUA	Quarries-----	0
Re	Reading Silt Loam, 0 To 2 Percent Slopes, Rarely Flooded-----	86
Ro	Riverwash-----	44
SU	Summit Silty Clay Loams, 3 To 7 Percent Slopes-----	68
SVV	Sibleyville-Vinland Loams, 3 To 7 Percent Slopes-----	37
Sa	Sand Pit-----	0
Sb	Sarpy-Eudora Complex, Overwash, Occasionally Flooded-----	43
Sc	Sharpsburg Silt Loam, 1 To 4 Percent Slopes-----	80
Sd	Sharpsburg Silt Loam, 4 To 10 Percent Slopes-----	76
Sh	Sibleyville Loam, 3 To 7 Percent Slopes-----	44
So	Sibleyville Loam, 3 To 7 Percent Slopes, Eroded-----	44
Ss	Sibleyville Complex, 3 To 7 Percent Slopes-----	43
St	Sibleyville Complex, 3 To 7 Percent Slopes, Eroded-----	32
Sv	Sibleyville Complex, 7 To 15 Percent Slopes-----	38
Sw	Sogn-Vinland Complex, 5 To 20 Percent Slopes-----	17
Sx	Vinland-Rock Outcrop Complex, 20 To 40 Percent Slopes-----	3
Tc	Thurman Complex, 4 To 10 Percent Slopes-----	62
VA	Verdigris Silt Loam, Channeled-----	61
Vc	Vinland Complex, 3 To 7 Percent Slopes-----	35

The "Soil Rating for Plant Growth, modified 1998" (SRPG) is a relative rating of the capacity of a soil to produce a specific plant under a defined management system. The index is determined from yield data on a few benchmark soils and is used to calculate yields, the net returns from crops, land assessment values, and taxes and to perform risk analysis when land management decisions are made. Specific information on plants and yields can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Map symbol	Soil name	Crop Index
Vh	Vinland Complex, 3 To 7 Percent Slopes, Eroded-----	18
Vm	Vinland-Martin Complex, 7 To 15 Percent Slopes-----	30
W	Water (less Than 40 Acres In Size)-----	0
Wc	Wabash Silty Clay Loam, Occasionally Flooded-----	64
Wh	Wabash Silty Clay, Occasionally Flooded-----	51
Wo	Woodson Silt Loam, 0 To 1 Percent Slopes-----	79
Ws	Woodson Silt Loam, 1 To 3 Percent Slopes-----	78
Wx	Woodson Silty Clay Loam, 1 To 3 Percent Slopes, Eroded-----	74

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(Entries under "Erosion factors--T" apply to the entire profile. Entries under "K", "Kf", "Wind Erodibility Group" and "Wind Erodibility Index" apply only to the surface layer)

Map symbol and soil name	Percent	Irr Cap Class	Nonirr Cap Class	Prime Farmland	Hydro- logic Group	Range site name	Windbreak suitability group	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								K	Kf	T		
059BC:BATES-----	90	N/A	2e	All areas are prime farmland	B	Loamy Upland (pe35-42)	6	.32	.32	3	5	56
059BD:BATES-----	60	N/A	4e	Not prime farmland	B	Loamy Upland (pe35-42)	6	.32	.32	3	5	56
059BD:COLLINSVIL LE-----	25	N/A	N/A	Not prime farmland	D	Shallow Sandstone (pe35- 42)	6	.32	.32	1	5	56
059BH:BATES-----	50	N/A	6s	Not prime farmland	B	Loamy Upland (pe35-42)	6	.32	.32	3	5	56
059BH:COLLINSVIL LE-----	35	N/A	7s	Not prime farmland	D	Shallow Sandstone (pe35- 42)	6	.32	.32	1	5	56
059BS:BOLIVAR---	50	N/A	6e	Not prime farmland	B	Savannah (pe35- 42)	6	.24	.32	3	5	56
059BS:HECTOR----	40	N/A	7e	Not prime farmland	D	Shallow Savannah (pe35-42)	6	.24	.28	1	5	56
059CM:CLARESON--	55	N/A	6e	Not prime farmland	C	Shallow Flats (pe35-42)	8	.32	.32	2	7	38
059CM:ERAM-----	30	N/A	6e	Not prime farmland	C	Clay Upland (pe35-42)	8	.37	.37	3	7	38
059DN:DENNIS----	60	N/A	3e	All areas are prime farmland	C	Loamy Upland (pe35-42)	7	.43	.43	5	6	48
059DN:BATES-----	30	N/A	3e	All areas are prime farmland	B	Loamy Upland (pe35-42)	6	.32	.32	3	5	56
059EA:ERAM-----	55	N/A	6e	Not prime farmland	C	Clay Upland (pe35-42)	8	.37	.37	3	7	38
059EA:LEBO-----	35	N/A	6e	Not prime farmland	B	Loamy Upland (pe35-42)	8	.32	.32	3	7	38
059EC:ERAM-----	60	N/A	4e	Not prime farmland	C	Clay Upland (pe35-42)	8	.37	.37	3	7	38
059EC:LULA-----	25	N/A	3e	Not prime farmland	B	Loamy Upland (pe35-42)	7	.37	.37	3	6	48
059LN:LEBO-----	75	N/A	7e	Not prime farmland	B	Loamy Upland (pe35-42)	9	.24	.64	3	8	0
059LN:ROCK OUTCROP-----	15	N/A	8e	Not prime farmland	D	Unspecified		---	---	-	---	0
059MB:MASON-----	90	N/A	1	All areas are prime farmland	B	Loamy Lowland (pe35-42)	7	.37	.37	5	6	48

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Map symbol and soil name	Percent	Irr Cap Class	Nonirr Cap Class	Prime Farmland	Hydro- logic Group	Range site name	Windbreak suitability group	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								K	Kf	T		
059OS:OSAGE-----	85	N/A	2w	Prime farmland if drained	D	Loamy Lowland (pe35-42)	4	.37	.37	5	4	86
059VB:VERDIGRIS--	85	N/A	2w	All areas are prime farmland	B	Loamy Lowland (pe35-42)	7	.32	.32	5	6	48
087EC:EUDORA-----	65	N/A	2w	Not prime farmland	B	Loamy Lowland (pe30-37)	6	.32	.32	5	5	56
087EC:BISMARCKGR OVE-----	20	N/A	2w	Not prime farmland	B	Loamy Lowland (pe30-37)	8	.32	.32	5	7	38
087FU:Fluvaquent s-----	100	N/A	5w	Not prime farmland	B	Unspecified	5	.37	.37	5	4L	86
087MU:MUSCOTAH--	85	2w-	2w	Not prime farmland	D	Unspecified	8	.37	.37	5	7	38
091EB:EUDORA-----	85	N/A	1	All areas are prime farmland	B	Loamy Lowland (pe30-37)	6	.32	.32	5	5	56
091MC:MORRILL---	85	N/A	3e	All areas are prime farmland	B	Loamy Upland (pe30-37)	7	.32	.32	5	6	48
139CM:CLARESON--	55	N/A	6e	Not prime farmland	C	Shallow Flats (pe35-42)	8	.32	.32	2	7	38
139CM:ERAM-----	30	N/A	6e	Not prime farmland	C	Clay Upland (pe35-42)	8	.37	.37	3	7	38
139ED:ELMONT-----	85	N/A	3e	All areas are prime farmland	B	Loamy Upland (pe35-42)	7	.32	.32	5	6	48
139LU:LULA-----	85	N/A	2e	All areas are prime farmland	C	Loamy Upland (pe35-42)	7	.37	.37	3	6	48
177MF:MARTIN-----	90	N/A	4e	Not prime farmland	C	Loamy Upland (pe35-42)	8	.37	.37	5	7	38
177SW:STONY STEEP LAND-----	60	N/A	8	Not prime farmland		Unspecified		---	---	-	---	---
177SW:VINLAND---	26	N/A	6e	Not prime farmland	D	Loamy Upland (pe30-37)	8	.32	.32	2	7	38
2326:KENOMA-----	90	N/A	3e	All areas are prime farmland	D	Clay Upland (pe35-42)	7	.43	.43	4	6	48
2540:LEANNA-----	85	N/A	2w	Prime farmland if drained	D	Clay Lowland (pe35-42)	7	.32	.32	3	6	48
2797:MORRILL-----	85	N/A	6e	Not prime farmland	B	Loamy Upland (pe30-37)	9	.20	.24	5	8	0
3460:SIBLEYVILLE	50	N/A	6e	Not prime farmland	B	Loamy Upland (pe35-42)	7	.28	.28	4	6	48

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Map symbol and soil name	Percent	Irr Cap Class	Nonirr Cap Class	Prime Farmland	Hydro- logic Group	Range site name	Windbreak suitability group	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								K	Kf	T		
3460:VINLAND----	35	N/A	6e	Not prime farmland	D	Loamy Upland (pe35-42)	7	.28	.28	2	6	48
3461:SIBLEYVILLE	85	N/A	4e	Not prime farmland	B	Loamy Upland (pe35-42)	7	.28	.28	4	6	48
3462:SIBLEYVILLE	85	N/A	3e	Not prime farmland	B	Loamy Upland (pe35-42)	7	.28	.28	4	6	48
3464:SIBLEYVILLE	50	N/A	4e	Not prime farmland	B	Loamy Upland (pe35-42)	7	.28	.28	4	6	48
3464:VINLAND----	30	N/A	6e	Not prime farmland	D	Loamy Upland (pe35-42)	7	.28	.28	2	6	48
3494:SUMMIT-----	85	N/A	2e	All areas are prime farmland	C	Clay Upland (pe35-42)	4	.37	.37	5	4	86
3495:SUMMIT-----	85	N/A	3e	Not prime farmland	C	Clay Upland (pe35-42)	4	.37	.37	5	4	86
3815:VERDIGRIS--	85	N/A	5w	Not prime farmland	B	Loamy Lowland (pe35-42)	7	.32	.32	5	6	48
3926:WATER (LESS THAN 40-----	100	N/A	N/A	Not prime farmland		Unspecified		---	---	-	---	---
3951:WOODSON----	85	N/A	3e	All areas are prime farmland	D	Clay Upland (pe35-42)	7	.43	.43	4	6	48
601KW:KONAWA----	90	N/A	6e	Not prime farmland	B	Savannah (pe30- 37)	3	.24	.24	5	3	86
601SA:SARPY-----	55	N/A	3w	Not prime farmland	A	Sandy Lowland (pe35-37)	2	.17	.17	5	2	134
601SA:HAYNIE----	35	N/A	2w	Not prime farmland	B	Loamy Lowland (pe35-37)	3	.37	.37	5	3	86
AED:ARENTS, EARTHEN DAM----	100	N/A	8	Not prime farmland		Unspecified		---	---	-	---	---
BOP:BORROW PITS-	100	N/A	N/A	Not prime farmland		Unspecified		---	---	-	---	---
Be:BASEHOR-----	50	N/A	6s	Not prime farmland	D	Shallow Savannah (pe30-37)	6	.32	.32	1	5	56
Et:EUDORA-----	90	N/A	1	All areas are prime farmland	B	Loamy Lowland (pe30-37)	6	.32	.32	5	5	56
Ev:EUDORA-----	60	N/A	2w	All areas are prime farmland	B	Loamy Lowland (pe30-37)	6	.32	.32	5	5	56
Ev:KIMO-----	30	N/A	2w	All areas are prime farmland	C	Clay Lowland (pe30-37)	4	.37	.37	5	4	86
Ew:EUDORA-----	65	N/A	1	All areas are prime farmland	B	Loamy Lowland (pe30-37)	3	.20	.20	5	3	86



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Field Office Thunderbook: Soils Properties for Conservation Planning--Continued

Map symbol and soil name	Percent	Irr Cap Class	Nonirr Cap Class	Prime Farmland	Hydro- logic Group	Range site name	Windbreak suitability group	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								K	Kf	T		
Ew:KIMO-----	25	N/A	2w	All areas are prime farmland	C	Clay Lowland (pe30-37)	3	.24	.24	5	3	86
Gm:GYMER-----	85	N/A	2e	All areas are prime farmland	C	Loamy Upland (pe30-37)	7	.32	.32	5	6	48
Gy:GYMER-----	88	N/A	3e	All areas are prime farmland	C	Loamy Upland (pe30-37)	7	.32	.32	5	6	48
Ju:JUDSON-----	85	N/A	1	All areas are prime farmland	B	Loamy Lowland (pe30-37)	7	.28	.28	5	6	48
KA:KENNEBEC----	99	N/A	5w	Not prime farmland	B	Unspecified	7	.28	.28	5	6	48
Kb:KENNEBEC----	95	N/A	2w	All areas are prime farmland	B	Loamy Lowland (pe35-42)	7	.28	.28	5	6	48
Kc:KENNEBEC----	88	N/A	5w	Not prime farmland	B	Loamy Lowland (pe30-37)	8	.28	.28	5	7	38
Km:KIMO-----	90	N/A	2w	All areas are prime farmland	C	Clay Lowland (pe30-37)	4	.37	.37	5	4	86
Le:LEANNA-----	85	N/A	2w	Prime farmland if drained	D	Loamy Lowland (pe35-42)	7	.37	.37	3	6	48
	85	N/A	2w	Prime farmland if drained	D	Clay Lowland (pe35-42)	7	.32	.32	3	6	48
M- W:MISCELLANEOUS WATER-----	100	N/A	N/A	Not prime farmland		Unspecified		---	---	-	---	---
Mb:MARTIN-----	90	N/A	2e	All areas are prime farmland	C	Loamy Upland (pe35-42)	8	.37	.37	5	7	38
Mc:MARTIN-----	85	N/A	3e	All areas are prime farmland	C	Loamy Upland (pe35-42)	8	.37	.37	5	7	38
Mh:MARTIN-----	85	N/A	4e	Not prime farmland	C	Loamy Upland (pe35-42)	8	.37	.37	5	7	38
Mo:MARTIN-----	40	N/A	3e	Not prime farmland	C	Loamy Upland (pe35-42)	8	.37	.37	5	7	38
Mo:OSKA-----	30	N/A	3e	Not prime farmland	C	Loamy Upland (pe35-42)	8	.37	.37	2	7	38
Mr:MORRILL-----	90	N/A	3e	All areas are prime farmland	B	Loamy Upland (pe30-37)	7	.28	.28	5	6	48
Ms:MORRILL-----	85	N/A	4e	Not prime farmland	B	Loamy Upland (pe30-37)	7	.28	.28	5	6	48

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Field Office Thunderbook: Soils Properties for Conservation Planning--Continued

Map symbol and soil name	Percent	Irr Cap Class	Nonirr Cap Class	Prime Farmland	Hydro- logic Group	Range site name	Windbreak suitability group	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								K	Kf	T		
Oe:OSKA-----	88	N/A	3e	Not prime farmland	C	Loamy Upland (pe35-42)	8	.37	.37	2	7	38
Pb:PAWNEE-----	90	N/A	2e	All areas are prime farmland	D	Clay Upland (pe30-37)	7	.37	.37	5	6	48
Pc:PAWNEE-----	85	N/A	3e	Not prime farmland	D	Clay Upland (pe30-37)	7	.37	.37	5	6	48
Ph:PAWNEE-----	90	N/A	3e	Not prime farmland	D	Clay Upland (pe30-37)	7	.37	.37	5	6	48
QUA:QUARRIES----	100	N/A	N/A	Not prime farmland		Unspecified		---	---	-	---	0
Re:READING-----	90	N/A	1	All areas are prime farmland	B	Loamy Lowland (pe35-42)	7	.32	.32	5	6	48
Ro:RIVER WASH---	100	N/A	8s	Not prime farmland		Unspecified		---	---	-	---	0
SU:SUMMIT-----	90	N/A	3e	All areas are prime farmland	C	Loamy Upland (pe35-42)	4	.37	.37	5	4	86
SVV:SIBLEYVILLE--	50	N/A	4e	Not prime farmland	B	Loamy Upland (pe35-42)	7	.28	.28	4	6	48
	45	N/A	4e	Not prime farmland	B	Loamy Upland (pe35-42)	7	.32	.32	3	6	48
SVV:VINLAND-----	35	N/A	N/A	Not prime farmland	D	Loamy Upland (pe35-42)	7	.28	.28	2	6	48
	30	N/A	6e	Not prime farmland	D	Loamy Upland (pe35-42)	7	.28	.28	2	6	48
Sa:SAND PIT-----	100	N/A	N/A	Not prime farmland		Unspecified		---	---	-	---	---
Sb:SARPY-----	55	N/A	3w	Not prime farmland	A	Sandy Lowland (pe30-37)	2	.17	.17	5	2	134
Sb:EUDORA-----	45	N/A	3w	Not prime farmland	B	Loamy Lowland (pe30-37)	3	.20	.20	5	3	86
Sc:SHARPSBURG---	88	N/A	2e	All areas are prime farmland	B	Loamy Upland (pe30-37)	7	.32	.32	5	6	48
Sd:SHARPSBURG---	85	N/A	3e	Not prime farmland	B	Loamy Upland (pe30-37)	7	.32	.32	5	6	48
Sh:SIBLEYVILLE--	90	N/A	3e	All areas are prime farmland	B	Loamy Upland (pe35-42)	7	.28	.28	3	6	48
	85	N/A	3e	Not prime farmland	B	Loamy Upland (pe35-42)	7	.28	.28	4	6	48
So:SIBLEYVILLE--	85	N/A	4e	Not prime farmland	B	Loamy Upland (pe35-42)	7	.28	.28	4	6	48
Ss:SIBLEYVILLE--	85	N/A	3e	Not prime farmland	B	Loamy Upland (pe35-42)	7	.28	.28	4	6	48

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Field Office Thunderbook: Soils Properties for Conservation Planning--Continued

Map symbol and soil name	Percent	Irr Cap Class	Nonirr Cap Class	Prime Farmland	Hydro- logic Group	Range site name	Windbreak suitability group	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								K	Kf	T		
	60	N/A	4e	Not prime farmland	B	Loamy Upland (pe35-42)	7	.28	.28	3	6	48
St:SIBLEYVILLE--	85	N/A	4e	Not prime farmland	B	Loamy Upland (pe35-42)	7	.28	.28	4	6	48
	50	N/A	4e	Not prime farmland	B	Loamy Upland (pe35-42)	7	.28	.28	3	6	48
Sv:SIBLEYVILLE--	50	N/A	6e	Not prime farmland	B	Loamy Upland (pe35-42)	7	.28	.28	3	6	48
Sw:SOGN-----	55	N/A	7s	Not prime farmland	D	Shallow Limy (pe35-42)	5	.32	.32	1	4L	86
Sw:VINLAND-----	30	N/A	6e	Not prime farmland	D	Loamy Upland (pe35-42)	8	.32	.32	2	7	38
Sx:ROCK OUTCROP-	60	N/A	8	Not prime farmland		Unspecified		---	---	-	---	0
Sx:VINLAND-----	26	N/A	6e	Not prime farmland	D	Loamy Upland (pe35-42)	8	.32	.32	2	7	38
Tc:THURMAN-----	35	N/A	4e	Not prime farmland	A	Savannah (pe30- 37)	2	.17	.17	5	2	134
VA:VERDIGRIS----	88	N/A	5w	Not prime farmland	B	Loamy Lowland (pe35-42)	7	.32	.32	5	6	48
Vc:VINLAND-----	50	N/A	6e	Not prime farmland	D	Loamy Upland (pe30-37)	8	.32	.32	2	7	38
Vh:VINLAND-----	60	N/A	6e	Not prime farmland	D	Loamy Upland (pe35-42)	8	.32	.32	2	7	38
Vm:VINLAND-----	40	N/A	6e	Not prime farmland	D	Loamy Upland (pe35-42)	8	.32	.32	2	7	38
Vm:MARTIN-----	25	N/A	4e	Not prime farmland	C	Loamy Upland (pe35-42)	8	.37	.37	5	7	38
W:WATER (< 40 ACRES)-----	100	N/A	N/A	Not prime farmland		Unspecified		---	---	-	---	---
Wc:WABASH-----	88	N/A	3w	Prime farmland if drained	D	Clay Lowland (pe30-37)	8	.28	.28	5	7	38
Wh:WABASH-----	90	N/A	3w	Prime farmland if drained	D	Clay Lowland (pe30-37)	4	.28	.28	5	4	86
Wo:WOODSON-----	90	N/A	2s	All areas are prime farmland	D	Clay Upland (pe35-42)	7	.43	.43	4	6	48
Ws:WOODSON-----	90	N/A	3e	All areas are prime farmland	D	Clay Upland (pe35-42)	7	.43	.43	4	6	48
	85	N/A	3e	All areas are prime farmland	D	Clay Upland (pe35-42)	7	.43	.43	4	6	48

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Field Office Thunderbook: Soils Properties for Conservation Planning--Continued

Map symbol and soil name	Percent	Irr Cap Class	Nonirr Cap Class	Prime Farmland	Hydro- logic Group	Range site name	Windbreak suitability group	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								K	Kf	T		
Wx:WOODSON-----	90	N/A	4e	All areas are prime farmland	D	Clay Upland (pe35-42)	8	.37	.37	4	7	38

RANGELAND PRODUCTIVITY  
Douglas County, Kansas

### Use and Explanation of Rangeland, Grazed Forest Land, Native Pastureland Interpretations

Information in this subsection can be used to plan the use and management of soils for rangeland, grazed forest land, and native pasture. Different kinds of soils vary in their capacity to produce native grasses and other plants suitable for grazing. Information in this subsection provides groupings of similar soils and estimates of potential forage production, which can be used to determine livestock stocking rates.

**Rangeland.** Range is land on which the native vegetation (climax or natural potential plant community) is predominantly grasses, grasslike plants, forbs, and shrubs suitable for grazing and browsing. Range includes natural grasslands, savannas, many wetlands, some deserts, tundra, and certain shrub and forb communities. Rangeland receives no regular or frequent cultural treatment. The composition and production of the plant community are determined by soil, climate, topography, overstory canopy, and grazing management.

**Grazed Forest Land.** Includes land on which the understory includes, as an integral part of the forest plant community, plants that can be grazed without significantly impairing other forest values.

**Native Pasture.** Includes land on which the native vegetation (climax or natural potential plant community) is forest but which is used and managed primarily for production of native plants for forage. Native pasture includes cut-over forest land and forest land cleared and now managed for native or naturalized forage plants.

#### Rangeland

In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland are closely related to the kind of soil. Effective management based on the relationship between the soils and vegetation and water.

The Rangeland, Grazed Forest land, Native Pastureland Interpretations shows, for each soil that supports rangeland vegetation, the ecological site and the potential annual production of vegetation in favorable, normal, unfavorable years. An explanation of the column headings in this table follows.

An ecological site is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time throughout the soil development process; a characteristic hydrology, particularly infiltration and runoff, that has developed over time; and a characteristic plant community (kind and amount of vegetation). The hydrology of a site is influenced by development of the soil and plant community. The vegetation, soils, and hydrology are all interrelated. Each is influenced by the others and influences the development of the others. The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in total production. Descriptions of ecological sites are provided in the Field Office Technical Guide, which is available in local offices of the Natural Resources Conservation Service.

Total dry-weight production is the amount of vegetation that can be expected to grow annually on well managed rangeland that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, average, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture. Yields are adjusted to a common percent of air-dry moisture content.

Range management requires a knowledge of the kinds of soil and of the potential natural plant community. It also requires an evaluation of the present range similarity index and rangeland trend. Range similarity index is determined by comparing the present plant community with the potential natural plant community on a particular rangeland ecological site. The more closely the existing community resembles the potential community, the higher the range similarity index. Rangeland trend is defined as the direction of change in an existing plant community relative to the potential natural plant community. Further information about the range similarity index and rangeland trend is available in chapter 4 of the National Range and Pasture Handbook, which is available in local offices of the Natural Resources Conservation Service. The objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as the potential natural plant community for that site. Such management generally results in the optimum production of vegetation, control of undesirable brush species, conservation of water, and control of erosion. Sometimes, however, an area with a range similarity index somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

RANGELAND PRODUCTIVITY--Continued  
Douglas County, Kansas

(Only the soils that support rangeland vegetation suitable for grazing are rated.) Refer to range site description to determine the percentage allowable of grasses, forbs, and shrubs for the range ecological site.

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Average year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
059BC: Bates-----	Loamy Upland (pe35-42)	7,000	5,500	4,500
059BD: Bates-----	Loamy Upland (pe35-42)	7,000	5,500	4,500
Collinsville-----	Shallow Sandstone (pe35-42)	3,500	2,300	1,500
059BH: Bates-----	Loamy Upland (pe35-42)	7,000	5,500	4,500
Collinsville-----	Shallow Sandstone (pe35-42)	3,500	2,300	1,500
059BS: Bolivar-----	Savannah (pe35-42)	5,400	3,000	2,200
Hector-----	Shallow Savannah (pe35-42)	4,800	3,500	2,000
059CM: Clareson-----	Shallow Flats (pe35-42)	5,000	4,000	2,500
Eram-----	Clay Upland (pe35-42)	6,000	4,200	3,000
059DN: Dennis-----	Loamy Upland (pe35-42)	7,000	5,500	4,500
Bates-----	Loamy Upland (pe35-42)	7,000	5,500	4,500
059EA: Eram-----	Clay Upland (pe35-42)	6,000	4,200	3,000
Lebo-----	Loamy Upland (pe35-42)	6,000	5,000	4,000
059EC: Eram-----	Clay Upland (pe35-42)	6,000	4,200	3,000
Lula-----	Loamy Upland (pe35-42)	7,000	5,500	4,500
059LN: Lebo-----	Loamy Upland (pe35-42)	5,500	4,000	3,000
Rock Outcrop-----	---	---	---	---
059MB: Mason-----	Loamy Lowland (pe35-42)	11,500	9,400	8,000
059OS: Osage-----	Loamy Lowland (pe35-42)	9,000	8,000	6,000
059VB: Verdigris-----	Loamy Lowland (pe35-42)	10,000	8,500	6,000
087EC: Eudora-----	Loamy Lowland (pe30-37)	10,000	8,000	6,000
Bismarckgrove-----	Loamy Lowland (pe30-37)	10,000	8,000	6,000
087FU: Fluvaquents-----	---	---	---	---
087MU: Muscotah-----	---	7,000	6,000	5,000
091EB: Eudora-----	Loamy Lowland (pe30-37)	10,000	8,000	6,000
091MC: Morrill-----	Loamy Upland (pe30-37)	6,000	5,000	4,000
139CM: Clareson-----	Shallow Flats (pe35-42)	5,000	4,000	2,500
Eram-----	Clay Upland (pe35-42)	6,000	4,200	3,000
139ED: Elmont-----	Loamy Upland (pe35-42)	7,000	5,500	4,000
139LU: Lula-----	Loamy Upland (pe35-42)	7,000	5,500	4,500
177MF: Martin-----	Loamy Upland (pe35-42)	7,000	5,500	4,000
177SW: Stony Steep Land-----	---	---	---	---
Vinland-----	Loamy Upland (pe30-37)	5,500	4,500	3,500
601KW: Konawa-----	Savannah (pe30-37)	4,500	3,300	2,500
601SA: Sarpy-----	Sandy Lowland (pe35-37)	3,800	3,500	3,000
Haynie-----	Loamy Lowland (pe35-37)	5,300	4,900	4,500
2326: Kenoma-----	Clay Upland (pe35-42)	6,000	4,500	2,500
2540: Leanna-----	Clay Lowland (pe35-42)	10,000	8,000	5,000
2797: Morrill, stony-----	Loamy Upland (pe30-37)	5,500	4,500	3,500
3460: Sibleyville-----	Loamy Upland (pe35-42)	6,000	5,000	3,500
Vinland-----	Loamy Upland (pe35-42)	5,500	4,500	3,500
3461: Sibleyville, eroded-----	Loamy Upland (pe35-42)	6,000	5,000	3,500
3462: Sibleyville-----	Loamy Upland (pe35-42)	6,000	5,000	3,500
3464: Sibleyville-----	Loamy Upland (pe35-42)	6,000	5,000	3,500
Vinland-----	Loamy Upland (pe35-42)	5,500	4,500	3,500
3494: Summit-----	Clay Upland (pe35-42)	6,000	4,000	2,500
3495: Summit-----	Clay Upland (pe35-42)	7,000	5,500	4,500
3815: Verdigris-----	Loamy Lowland (pe35-42)	10,000	8,500	6,000
3926: Water (less Than 40-----	---	---	---	---
3951:				

RANGELAND PRODUCTIVITY--Continued  
Douglas County, Kansas

(Only the soils that support rangeland vegetation suitable for grazing are rated.) Refer to range site description to determine the percentage allowable of grasses, forbs, and shrubs for the range ecological site.

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Average year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
Woodson-----	Clay Upland (pe35-42)	6,000	4,000	2,500
AED:				
Arents, Earthen Dam-----	---	---	---	---
Be:				
Basehor-----	Shallow Savannah (pe30-37)	3,500	2,500	2,000
BOP:				
Borrow Pits-----	---	---	---	---
Et:				
Eudora-----	Loamy Lowland (pe30-37)	10,000	8,000	6,000
Ev:				
Eudora-----	Loamy Lowland (pe30-37)	10,000	8,000	6,000
Kimo-----	Clay Lowland (pe30-37)	9,000	7,000	5,000
Ew:				
Eudora-----	Loamy Lowland (pe30-37)	10,000	8,000	6,000
Kimo-----	Clay Lowland (pe30-37)	9,000	7,000	5,000
Gm:				
Gymer-----	Loamy Upland (pe30-37)	7,000	5,500	4,000
Gy:				
Gymer-----	Loamy Upland (pe30-37)	7,000	5,500	4,000
Ju:				
Judson-----	Loamy Lowland (pe30-37)	5,300	4,900	4,500
KA:				
Kennebec-----	---	---	---	---
Kb:				
Kennebec-----	Loamy Lowland (pe35-42)	10,000	8,000	6,000
Kc:				
Kennebec-----	Loamy Lowland (pe30-37)	10,000	8,000	6,000
Km:				
Kimo-----	Clay Lowland (pe30-37)	9,000	7,000	5,000
Le:				
Leanna-----	Loamy Lowland (pe35-42)	10,000	8,000	5,000
M-W:				
Miscellaneous Water-----	---	---	---	---
Mb:				
Martin-----	Loamy Upland (pe35-42)	7,000	5,500	4,000
Mc:				
Martin-----	Loamy Upland (pe35-42)	7,000	5,500	4,000
Mh:				
Martin, eroded-----	Loamy Upland (pe35-42)	7,000	5,500	4,000
Mo:				
Martin-----	Loamy Upland (pe35-42)	7,000	5,500	4,000
Oska-----	Loamy Upland (pe35-42)	6,000	5,000	3,500
Mr:				
Morrill-----	Loamy Upland (pe30-37)	6,000	5,000	4,000
Ms:				
Morrill-----	Loamy Upland (pe30-37)	6,000	5,000	4,000
Oe:				
Oska-----	Loamy Upland (pe35-42)	6,000	5,000	3,500
Pb:				
Pawnee-----	Clay Upland (pe30-37)	3,700	3,200	2,700
Pc:				
Pawnee-----	Clay Upland (pe30-37)	3,700	3,200	2,700
Ph:				
Pawnee, eroded-----	Clay Upland (pe30-37)	3,700	3,200	2,700
QUA:				
Quarries-----	---	---	---	---
Re:				
Reading-----	Loamy Lowland (pe35-42)	10,000	8,000	6,000
Ro:				
River Wash-----	---	---	---	---
Sa:				
Sand Pit-----	---	---	---	---
Sb:				
Sarpy-----	Sandy Lowland (pe30-37)	3,800	3,500	3,000
Eudora-----	Loamy Lowland (pe30-37)	10,000	8,000	6,000
Sc:				
Sharpsburg-----	Loamy Upland (pe30-37)	4,800	4,400	4,000
Sd:				
Sharpsburg-----	Loamy Upland (pe30-37)	4,800	4,400	4,000
Sh:				
Sibleyville-----	Loamy Upland (pe35-42)	6,000	5,000	3,500
So:				
Sibleyville, eroded-----	Loamy Upland (pe35-42)	6,000	5,000	3,500
Ss:				
Sibleyville-----	Loamy Upland (pe35-42)	6,000	5,000	3,500
St:				
Sibleyville, eroded-----	Loamy Upland (pe35-42)	6,000	5,000	3,500
SU:				
Summit-----	Loamy Upland (pe35-42)	7,000	5,500	4,500
Sv:				
Sibleyville-----	Loamy Upland (pe35-42)	6,000	5,000	3,500
SVV:				
Sibleyville-----	Loamy Upland (pe35-42)	6,000	5,000	3,500
Vinland-----	Loamy Upland (pe35-42)	5,500	4,500	3,500
Sw:				

RANGELAND PRODUCTIVITY--Continued  
Douglas County, Kansas

(Only the soils that support rangeland vegetation suitable for grazing are rated.) Refer to range site description to determine the percentage allowable of grasses, forbs, and shrubs for the range ecological site.

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Average year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
Sogn-----	Shallow Limy (pe35-42)	3,500	2,500	1,500
Vinland-----	Loamy Upland (pe35-42)	5,500	4,500	3,500
Sx: Rock Outcrop-----	---	---	---	---
Vinland-----	Loamy Upland (pe35-42)	5,500	4,500	3,500
Tc: Thurman-----	Savannah (pe30-37)	3,500	3,300	3,000
VA: Verdigris-----	Loamy Lowland (pe35-42)	10,000	8,500	6,000
Vc: Vinland-----	Loamy Upland (pe30-37)	5,500	4,500	3,500
Vh: Vinland-----	Loamy Upland (pe35-42)	5,500	4,500	3,500
Vm: Vinland-----	Loamy Upland (pe35-42)	5,500	4,500	3,500
Martin-----	Loamy Upland (pe35-42)	7,000	5,500	4,000
W: Water (< 40 Acres)-----	---	---	---	---
Wc: Wabash-----	Clay Lowland (pe30-37)	10,000	9,000	7,000
Wh: Wabash-----	Clay Lowland (pe30-37)	10,000	9,000	7,000
Wo: Woodson-----	Clay Upland (pe35-42)	6,000	4,500	2,500
Ws: Woodson-----	Clay Upland (pe35-42)	6,000	4,500	2,500
Wx: Woodson, eroded-----	Clay Upland (pe35-42)	6,000	4,500	2,500



BUILDING SITE DEVELOPMENT  
Douglas County, Kansas

Building Site Development

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. The following tables show the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, shallow excavations, and lawns and landscaping.

The ratings in the tables are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. Not limited indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. Slightly limited indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. Somewhat limited indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. Very limited indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

BUILDING SITE DEVELOPMENT--Continued  
Douglas County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
059BC: Bates-----	90	Not limited		Somewhat limited Depth to soft bedrock	0.42	Not limited	
059BD: Bates-----	60	Not limited		Somewhat limited Depth to soft bedrock	0.01	Somewhat limited Slope	0.12
Collinsville-----	25	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock Slope	0.12
059BH: Bates-----	50	Somewhat limited Slope	0.00	Somewhat limited Depth to soft bedrock Slope	0.15	Very limited Slope	1.00
Collinsville-----	35	Very limited Depth to hard bedrock Slope	1.00 0.16	Very limited Depth to hard bedrock Slope	1.00 0.16	Very limited Depth to hard bedrock Slope	1.00
059BS: Bolivar-----	50	Somewhat limited Shrink-swell Slope	0.50 0.04	Somewhat limited Shrink-swell Depth to soft bedrock Slope	0.50 0.15 0.04	Very limited Slope Shrink-swell	1.00 0.50
Hector-----	40	Very limited Depth to hard bedrock Slope	1.00 0.04	Very limited Depth to hard bedrock Slope	1.00 0.04	Very limited Depth to hard bedrock Slope	1.00
059CM: Clareson-----	55	Very limited Shrink-swell Content of large stones Depth to hard bedrock Slope	1.00 0.81 0.79 0.04	Very limited Shrink-swell Depth to hard bedrock Content of large stones Slope	1.00 1.00 0.81 0.04	Very limited Shrink-swell Slope Content of large stones Depth to hard bedrock	1.00 1.00 0.81
Eram-----	30	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 0.00	Very limited Depth to saturated zone Shrink-swell Depth to soft bedrock Slope	1.00 1.00 0.01 0.00	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 1.00
059DN: Dennis-----	60	Very limited Shrink-swell  Depth to saturated zone	1.00  1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Shrink-swell  Depth to saturated zone Slope	1.00  1.00 0.00
Bates-----	30	Not limited		Somewhat limited Depth to soft bedrock	0.15	Somewhat limited Slope	0.00
059EA: Eram-----	55	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 0.16	Very limited Depth to saturated zone Shrink-swell Slope Depth to soft bedrock	1.00 1.00 0.16 0.01	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 1.00
Lebo-----	35	Somewhat limited Shrink-swell  Slope	0.50  0.16	Somewhat limited Depth to soft bedrock Shrink-swell Slope	0.64  0.50 0.16	Very limited Slope  Shrink-swell	1.00  0.50

BUILDING SITE DEVELOPMENT--Continued  
Douglas County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
059EC: Eram-----	60	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell Depth to soft bedrock	1.00 1.00 0.01	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 0.12
Lula-----	25	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to hard bedrock	1.00 0.88	Very limited Shrink-swell Slope	1.00 0.00
059LN: Lebo-----	75	Very limited Slope Shrink-swell	1.00 0.50	Very limited Slope Depth to soft bedrock Shrink-swell	1.00 0.64 0.50	Very limited Slope Shrink-swell	1.00 0.50
Rock Outcrop-----	15	Not rated		Not rated		Not rated	
059MB: Mason-----	90	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50
059OS: Osage-----	85	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00
059VB: Verdigris-----	85	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50
087EC: Eudora-----	65	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Bismarckgrove-----	20	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50
087FU: Fluvaquents-----	100	Very limited Flooding Depth to saturated zone	1.00 0.03	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 0.03
087MU: Muscotah-----	85	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 1.00 0.07	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 1.00 1.00	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 1.00 0.07
091EB: Eudora-----	85	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
091MC: Morrill-----	85	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.48
139CM: Clareson-----	55	Very limited Shrink-swell Depth to hard bedrock Content of large stones Slope	1.00 0.90 0.53 0.04	Very limited Shrink-swell Depth to hard bedrock Content of large stones Slope	1.00 1.00 0.53 0.04	Very limited Shrink-swell Slope Depth to hard bedrock Content of large stones	1.00 1.00 0.90 0.53
Eram-----	30	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 0.00	Very limited Depth to saturated zone Shrink-swell Depth to soft bedrock Slope	1.00 1.00 0.64 0.00	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 1.00
139ED: Elmont-----	85	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.12

BUILDING SITE DEVELOPMENT--Continued  
Douglas County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
139LU: Lula-----	85	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to hard bedrock Shrink-swell	0.88 0.50	Somewhat limited Shrink-swell	0.50
177MF: Martin-----	90	Very limited Shrink-swell	1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Shrink-swell	1.00
		Depth to saturated zone	0.44			Slope	1.00
		Slope	0.04	Slope	0.04	Depth to saturated zone	0.44
177SW: Stony Steep Land----	60	Not rated		Not rated		Not rated	
Vinland-----	26	Very limited Depth to soft bedrock Slope	1.00 1.00	Very limited Depth to soft bedrock Slope	1.00 1.00	Very limited Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Depth to soft bedrock Shrink-swell	1.00 0.50
601KW: Konawa-----	90	Somewhat limited Slope Shrink-swell	0.96 0.50	Somewhat limited Slope Shrink-swell	0.96 0.50	Very limited Slope Shrink-swell	1.00 0.50
601SA: Sarpy-----	55	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Haynie-----	35	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
2326: Kenoma-----	90	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00
2540: Leanna-----	85	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00
2797: Morrill, stony-----	85	Somewhat limited Shrink-swell Slope	0.50 0.04	Somewhat limited Shrink-swell Slope	0.50 0.04	Very limited Slope Shrink-swell	1.00 0.50
3460: Sibleyville-----	50	Somewhat limited Slope	0.37	Somewhat limited Depth to soft bedrock Slope	0.71 0.37	Very limited Slope	1.00
Vinland-----	35	Somewhat limited Depth to soft bedrock Slope	1.00 0.37	Very limited Depth to soft bedrock Slope	1.00 0.37	Very limited Depth to soft bedrock Slope	1.00 1.00
3461: Sibleyville, eroded-	85	Not limited		Somewhat limited Depth to soft bedrock	0.71	Somewhat limited Slope	0.12
3462: Sibleyville-----	85	Not limited		Somewhat limited Depth to soft bedrock	0.71	Somewhat limited Slope	0.12
3464: Sibleyville-----	50	Not limited		Not limited		Somewhat limited Slope	0.12
Vinland-----	30	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Somewhat limited Depth to soft bedrock Slope	1.00 0.12
3494: Summit-----	85	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to saturated zone	1.00 1.00	Very limited Shrink-swell	1.00

BUILDING SITE DEVELOPMENT--Continued  
Douglas County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3495: Summit-----	85	Very limited Shrink-swell  Depth to saturated zone	1.00  0.39	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Shrink-swell  Slope  Depth to saturated zone	1.00  0.48  0.39
3815: Verdigris-----	85	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50
3926: Water (less Than 40-	100	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
3951: Woodson-----	85	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00
AED: Arents, Earthen Dam-	100	Not rated		Not rated		Not rated	
Be: Basehor-----	50	Very limited Depth to hard bedrock Slope	1.00 0.37	Very limited Depth to hard bedrock Slope	1.00 0.37	Very limited Depth to hard bedrock Slope	1.00 1.00
BOP: Borrow Pits-----	100	Not rated		Not rated		Not rated	
Et: Eudora-----	90	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Ev: Eudora-----	60	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Kimo-----	30	Very limited Flooding Shrink-swell  Depth to saturated zone	1.00 1.00  0.39	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Shrink-swell  Depth to saturated zone	1.00 1.00  0.39
Ew: Eudora-----	65	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Kimo-----	25	Very limited Flooding Shrink-swell	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 0.61	Very limited Flooding Shrink-swell	1.00 1.00
Gm: Gymer-----	85	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
Gy: Gymer-----	88	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.48
Ju: Judson-----	85	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50
KA: Kennebec-----	99	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 0.61 0.50	Very limited Flooding Shrink-swell	1.00 0.50
Kb: Kennebec-----	95	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 0.82 0.50	Very limited Flooding Shrink-swell	1.00 0.50

BUILDING SITE DEVELOPMENT--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Kc: Kennebec-----	88	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 0.82 0.50	Very limited Flooding Shrink-swell	1.00 0.50
Km: Kimo-----	90	Very limited Flooding Shrink-swell  Depth to saturated zone	1.00 1.00 0.39	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Shrink-swell  Depth to saturated zone	1.00 1.00 0.39
Le: Leanna-----	85	Very limited Flooding Shrink-swell  Depth to saturated zone	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Flooding Shrink-swell  Depth to saturated zone	1.00 1.00 1.00
M-W: Miscellaneous Water-	100	Not rated		Not rated		Not rated	
Mb: Martin-----	90	Very limited Shrink-swell  Depth to saturated zone	1.00 0.39	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Shrink-swell  Depth to saturated zone	1.00 0.39
Mc: Martin-----	85	Very limited Shrink-swell  Depth to saturated zone	1.00 0.39	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Shrink-swell  Depth to saturated zone Slope	1.00 0.39 0.12
Mh: Martin, eroded-----	85	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell Slope	1.00 0.12
Mo: Martin-----	40	Very limited Shrink-swell  Depth to saturated zone	1.00 0.39	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Shrink-swell  Depth to saturated zone Slope	1.00 0.39 0.12
Oska-----	30	Very limited Shrink-swell Depth to hard bedrock	1.00 0.01	Very limited Shrink-swell Depth to hard bedrock	1.00 1.00	Very limited Shrink-swell Slope  Depth to hard bedrock	1.00 0.12 0.01
Mr: Morrill-----	90	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.12
Ms: Morrill-----	85	Somewhat limited Shrink-swell Slope	0.50 0.16	Somewhat limited Shrink-swell Slope	0.50 0.16	Very limited Slope Shrink-swell	1.00 0.50
Oe: Oska-----	88	Very limited Shrink-swell Depth to hard bedrock	1.00 0.01	Very limited Shrink-swell Depth to hard bedrock	1.00 1.00	Very limited Shrink-swell Slope  Depth to hard bedrock	1.00 0.12 0.01
Pb: Pawnee-----	90	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00

BUILDING SITE DEVELOPMENT--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Pc: Pawnee-----	85	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 0.12
Ph: Pawnee, eroded-----	90	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 0.12
QUA: Quarries-----	100	Not rated		Not rated		Not rated	
Re: Reading-----	90	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50
Ro: River Wash-----	100	Not rated		Not rated		Not rated	
Sa: Sand Pit-----	100	Not rated		Not rated		Not rated	
Sb: Sarpy-----	55	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Eudora-----	45	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Sc: Sharpsburg-----	88	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell	0.50	Very limited Shrink-swell	1.00
Sd: Sharpsburg-----	85	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell	0.50	Very limited Shrink-swell Slope	1.00 0.86
Sh: Sibleyville-----	90	Not limited		Somewhat limited Depth to soft bedrock	0.71	Somewhat limited Slope	0.12
So: Sibleyville, eroded-	85	Not limited		Somewhat limited Depth to soft bedrock	0.71	Somewhat limited Slope	0.12
Ss: Sibleyville-----	60	Not limited		Somewhat limited Depth to soft bedrock	0.29	Somewhat limited Slope	0.12
St: Sibleyville, eroded-	50	Not limited		Somewhat limited Depth to soft bedrock	0.71	Somewhat limited Slope	0.12
SU: Summit-----	90	Very limited Shrink-swell Depth to saturated zone	1.00 0.39	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Shrink-swell Depth to saturated zone Slope	1.00 0.39 0.12
Sv: Sibleyville-----	50	Somewhat limited Slope	0.37	Somewhat limited Depth to soft bedrock Slope	0.71 0.37	Very limited Slope	1.00
SVV: Sibleyville-----	45	Not limited		Somewhat limited Depth to soft bedrock	0.54	Somewhat limited Slope	0.12
Vinland-----	35	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Somewhat limited Depth to soft bedrock Slope	1.00 0.12

BUILDING SITE DEVELOPMENT--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
S <sub>w</sub> : Sogn-----	55	Very limited Depth to hard bedrock Slope Shrink-swell	1.00 0.84 0.50	Very limited Depth to hard bedrock Slope Shrink-swell	1.00 0.84 0.50	Very limited Depth to hard bedrock Slope Shrink-swell	1.00 1.00 0.50
Vinland-----	30	Somewhat limited Depth to soft bedrock Shrink-swell Slope	1.00 1.00 0.50 0.37	Very limited Depth to soft bedrock Shrink-swell Slope	1.00 1.00 0.50 0.37	Very limited Depth to soft bedrock Slope Shrink-swell	1.00 1.00 1.00 0.50
S <sub>x</sub> : Rock Outcrop-----	60	Not rated		Not rated		Not rated	
Vinland-----	26	Very limited Slope Depth to soft bedrock Shrink-swell	1.00 1.00 1.00 0.50	Very limited Slope Depth to soft bedrock Shrink-swell	1.00 1.00 1.00 0.50	Very limited Slope Depth to soft bedrock Shrink-swell	1.00 1.00 1.00 0.50
T <sub>c</sub> : Thurman-----	35	Not limited		Not limited		Somewhat limited Slope	0.86
V <sub>A</sub> : Verdigris-----	88	Very limited Flooding Shrink-swell	1.00 1.00 0.50	Very limited Flooding Shrink-swell	1.00 1.00 0.50	Very limited Flooding Shrink-swell	1.00 1.00 0.50
V <sub>c</sub> : Vinland-----	50	Somewhat limited Depth to soft bedrock Shrink-swell	1.00 1.00 0.50	Very limited Depth to soft bedrock Shrink-swell	1.00 1.00 0.50	Somewhat limited Depth to soft bedrock Shrink-swell Slope	1.00 1.00 0.50 0.12
V <sub>h</sub> : Vinland-----	60	Somewhat limited Depth to soft bedrock Shrink-swell	1.00 1.00 0.50	Very limited Depth to soft bedrock Shrink-swell	1.00 1.00 0.50	Somewhat limited Depth to soft bedrock Shrink-swell Slope	1.00 1.00 0.50 0.12
V <sub>m</sub> : Vinland-----	40	Somewhat limited Depth to soft bedrock Shrink-swell Slope	1.00 1.00 0.50 0.37	Very limited Depth to soft bedrock Shrink-swell Slope	1.00 1.00 0.50 0.37	Very limited Depth to soft bedrock Slope Shrink-swell	1.00 1.00 1.00 0.50
Martin-----	25	Very limited Shrink-swell Depth to saturated zone Slope	1.00 1.00 0.39 0.04	Very limited Depth to saturated zone Shrink-swell Slope	1.00 1.00 1.00 0.04	Very limited Shrink-swell Slope Depth to saturated zone	1.00 1.00 1.00 0.39
W: Water (< 40 Acres)--	100	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
W <sub>c</sub> : Wabash-----	88	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00 1.00
W <sub>h</sub> : Wabash-----	90	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 1.00 1.00 1.00
W <sub>o</sub> : Woodson-----	90	Very limited Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00 1.00
W <sub>s</sub> : Woodson-----	90	Very limited Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00 1.00



BUILDING SITE DEVELOPMENT--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Wx: Woodson, eroded-----	90	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00

BUILDING SITE DEVELOPMENT--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
059BC: Bates-----	90	Not limited		Very limited Cutbanks cave Depth to soft bedrock	1.00 0.42	Somewhat limited Depth to bedrock	0.42
059BD: Bates-----	60	Not limited		Very limited Cutbanks cave Depth to soft bedrock	1.00 0.01	Somewhat limited Depth to bedrock	0.01
Collinsville-----	25	Very limited Depth to hard bedrock	1.00	Very limited Depth to hard bedrock Cutbanks cave	1.00 0.10	Very limited Depth to bedrock  Droughty Content of large stones	1.00  0.73 0.03
059BH: Bates-----	50	Somewhat limited Slope	0.00	Very limited Cutbanks cave Depth to soft bedrock Slope	1.00 0.15 0.00	Somewhat limited Depth to bedrock Slope	0.16 0.00
Collinsville-----	35	Very limited Depth to hard bedrock Slope	1.00 0.16	Very limited Depth to hard bedrock Slope Cutbanks cave	1.00 0.16 0.10	Very limited Depth to bedrock  Droughty Slope Content of large stones	1.00  0.73 0.16 0.03
059BS: Bolivar-----	50	Somewhat limited Shrink-swell Slope	0.50 0.04	Somewhat limited Depth to soft bedrock Cutbanks cave Slope	0.15 0.10 0.04	Somewhat limited Depth to bedrock Slope	0.16 0.04
Hector-----	40	Very limited Depth to hard bedrock Slope	1.00 0.04	Very limited Depth to hard bedrock Cutbanks cave Slope	1.00 0.10 0.04	Very limited Depth to bedrock  Droughty Slope	1.00  0.98 0.04
059CM: Clareson-----	55	Very limited Shrink-swell  Content of large stones Depth to hard bedrock Slope	1.00  0.81 0.79 0.04	Very limited Depth to hard bedrock Content of large stones Cutbanks cave Slope	1.00  0.81 0.10 0.04	Somewhat limited Depth to bedrock  Droughty Content of large stones Slope	0.80  0.31 0.20 0.04
Eram-----	30	Very limited Shrink-swell  Depth to saturated zone Slope	1.00  1.00 0.00	Very limited Depth to saturated zone Too clayey  Cutbanks cave Depth to soft bedrock Slope	1.00  0.12  0.10 0.01 0.00	Very limited Depth to saturated zone Depth to bedrock  Slope	1.00  0.01  0.00
059DN: Dennis-----	60	Very limited Shrink-swell  Depth to saturated zone	1.00  0.94	Very limited Depth to saturated zone Too clayey  Cutbanks cave	1.00  0.12  0.10	Somewhat limited Depth to saturated zone	0.94
Bates-----	30	Not limited		Very limited Cutbanks cave Depth to soft bedrock	1.00 0.15	Somewhat limited Depth to bedrock	0.16

BUILDING SITE DEVELOPMENT--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
059EA: Eram-----	55	Very limited Shrink-swell	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Slope	0.16	Slope	0.16
		Slope	0.16	Too clayey	0.12	Depth to bedrock	0.01
				Cutbanks cave	0.10		
				Depth to soft bedrock	0.01		
Lebo-----	35	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to soft bedrock	0.64	Somewhat limited Depth to bedrock	0.65
		Slope	0.16	Slope	0.16	Slope	0.16
				Cutbanks cave	0.10		
059EC: Eram-----	60	Very limited Shrink-swell	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Too clayey	0.12	Depth to bedrock	0.01
				Cutbanks cave	0.10		
				Depth to soft bedrock	0.01		
Lula-----	25	Very limited Shrink-swell	1.00	Somewhat limited Depth to hard bedrock	0.88	Not limited	
				Cutbanks cave	0.10		
059LN: Lebo-----	75	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
		Shrink-swell	0.50	Depth to soft bedrock	0.64	Content of large stones	1.00
				Cutbanks cave	0.10	Depth to bedrock	0.65
						Droughty	0.18
Rock Outcrop-----	15	Not rated		Not rated		Not rated	
059MB: Mason-----	90	Somewhat limited Shrink-swell	0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
		Flooding	0.40				
059OS: Osage-----	85	Very limited Shrink-swell	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Flooding	0.60	Flooding	0.60
		Flooding	1.00	Too clayey	0.32		
				Cutbanks cave	0.10		
059VB: Verdigris-----	85	Very limited Flooding	1.00	Somewhat limited Flooding	0.60	Somewhat limited Flooding	0.60
		Shrink-swell	0.50	Cutbanks cave	0.10		
087EC: Eudora-----	65	Very limited Frost action	1.00	Somewhat limited Flooding	0.60	Somewhat limited Flooding	0.60
		Flooding	1.00	Cutbanks cave	0.10		
Bismarckgrove-----	20	Very limited Frost action	1.00	Very limited Cutbanks cave	1.00	Somewhat limited Flooding	0.60
		Flooding	1.00	Flooding	0.60		
		Shrink-swell	0.50				
087FU: Fluvaquents-----	100	Very limited Frost action	1.00	Very limited Depth to saturated zone	1.00	Very limited Flooding	1.00
		Flooding	1.00	Flooding	0.80	Depth to saturated zone	0.02
		Depth to saturated zone	0.02	Cutbanks cave	0.10		
087MU: Muscotah-----	85	Very limited Shrink-swell	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.03
		Frost action	0.50	Cutbanks cave	0.10		
		Flooding	0.20	Too clayey	0.08		
		Depth to saturated zone	0.03				

BUILDING SITE DEVELOPMENT--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
091EB: Eudora-----	85	Very limited Frost action Flooding	1.00 0.40	Somewhat limited Cutbanks cave	0.10	Not limited	
091MC: Morrill-----	85	Somewhat limited Shrink-swell Frost action	0.50 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
139CM: Clareson-----	55	Very limited Shrink-swell	1.00	Very limited Depth to hard bedrock	1.00	Somewhat limited Depth to bedrock	0.90
		Depth to hard bedrock	0.90	Content of large stones	0.53	Droughty	0.29
		Content of large stones	0.53	Cutbanks cave	0.10	Content of large stones	0.20
		Slope	0.04	Slope	0.04	Slope	0.04
Eram-----	30	Very limited Shrink-swell	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to soft bedrock	0.64	Depth to bedrock	0.65
		Slope	0.00	Too clayey	0.12	Slope	0.00
				Cutbanks cave	0.10		
				Slope	0.00		
139ED: Elmont-----	85	Very limited Frost action Shrink-swell	1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
139LU: Lula-----	85	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to hard bedrock	0.88	Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
177MF: Martin-----	90	Very limited Frost action	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.22
		Shrink-swell	1.00	Too clayey	0.32	Slope	0.04
		Depth to saturated zone	0.22	Cutbanks cave	0.10		
		Slope	0.04	Slope	0.04		
177SW: Stony Steep Land----	60	Not rated		Not rated		Not rated	
Vinland-----	26	Very limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Very limited Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10	Droughty	0.05
		Frost action	0.50				
601KW: Konawa-----	90	Somewhat limited Slope Shrink-swell	0.96 0.50	Somewhat limited Slope Cutbanks cave	0.96 0.10	Somewhat limited Slope	0.96
601SA: Sarpy-----	55	Very limited Flooding	1.00	Very limited Cutbanks cave Flooding	1.00 0.60	Somewhat limited Droughty Flooding	0.69 0.60
Haynie-----	35	Very limited Frost action Flooding	1.00 1.00	Somewhat limited Flooding Cutbanks cave	0.60 0.10	Somewhat limited Flooding	0.60
2326: Kenoma-----	90	Very limited Low strength	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Shrink-swell	1.00	Too clayey	0.50		
		Depth to saturated zone	1.00	Cutbanks cave	0.10		
2540: Leanna-----	85	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	1.00	Too clayey	0.04		

BUILDING SITE DEVELOPMENT--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2797: Morrill, stony-----	85	Somewhat limited Shrink-swell Frost action Slope	0.50 0.50 0.04	Very limited Cutbanks cave Slope	1.00 0.04	Somewhat limited Slope	0.04
3460: Sibleyville-----	50	Somewhat limited Frost action Slope	0.50 0.37	Somewhat limited Depth to soft bedrock Slope Cutbanks cave	0.71 0.37 0.10	Somewhat limited Depth to bedrock Slope	0.71 0.37
Vinland-----	35	Somewhat limited Depth to soft bedrock Low strength Frost action Slope	1.00 0.78 0.50 0.37	Very limited Depth to soft bedrock Slope Cutbanks cave	1.00 0.37 0.10	Very limited Depth to bedrock Slope Droughty	1.00 0.37 0.16
3461: Sibleyville, eroded-	85	Somewhat limited Frost action	0.50	Somewhat limited Depth to soft bedrock Cutbanks cave	0.71 0.10	Somewhat limited Depth to bedrock	0.71
3462: Sibleyville-----	85	Somewhat limited Frost action	0.50	Somewhat limited Depth to soft bedrock Cutbanks cave	0.71 0.10	Somewhat limited Depth to bedrock	0.71
3464: Sibleyville-----	50	Somewhat limited Frost action	0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Vinland-----	30	Somewhat limited Depth to soft bedrock Low strength Frost action	1.00 0.78 0.50	Very limited Depth to soft bedrock Cutbanks cave	1.00 0.10	Very limited Depth to bedrock Droughty	1.00 0.16
3494: Summit-----	85	Very limited Shrink-swell Low strength	1.00 1.00	Very limited Depth to saturated zone Too clayey Cutbanks cave	1.00 0.59 0.10	Not limited	
3495: Summit-----	85	Very limited Shrink-swell Low strength Depth to saturated zone	1.00 1.00 0.19	Very limited Depth to saturated zone Too clayey Cutbanks cave	1.00 0.59 0.10	Somewhat limited Depth to saturated zone	0.19
3815: Verdigris-----	85	Very limited Flooding Low strength Shrink-swell	1.00 1.00 0.50	Somewhat limited Flooding Cutbanks cave	0.80 0.10	Very limited Flooding	1.00
3926: Water (less Than 40-	100	Very limited Slope Low strength	1.00 1.00	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
3951: Woodson-----	85	Very limited Depth to saturated zone Low strength Shrink-swell	1.00 1.00 1.00	Very limited Depth to saturated zone Too clayey Cutbanks cave	1.00 0.50 0.10	Very limited Depth to saturated zone	1.00
AED: Arents, Earthen Dam-	100	Not rated		Not rated		Not rated	
Be: Basehor-----	50	Very limited Depth to hard bedrock Frost action Slope	1.00 0.50 0.37	Very limited Depth to hard bedrock Slope Cutbanks cave	1.00 0.37 0.10	Very limited Depth to bedrock Droughty Slope Content of large stones	1.00 0.96 0.37 0.03

BUILDING SITE DEVELOPMENT--Continued  
Douglas County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BOP: Borrow Pits-----	100	Not rated		Not rated		Not rated	
Et: Eudora-----	90	Very limited Frost action Flooding	1.00 0.40	Somewhat limited Cutbanks cave	0.10	Not limited	
Ev: Eudora-----	60	Very limited Frost action Flooding	1.00 0.40	Somewhat limited Cutbanks cave	0.10	Not limited	
Kimo-----	30	Very limited Frost action	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.19
		Shrink-swell Flooding Depth to saturated zone	1.00 0.40 0.19	Too clayey Cutbanks cave	0.12 0.10		
Ew: Eudora-----	65	Very limited Frost action Flooding	1.00 0.40	Somewhat limited Cutbanks cave	0.10	Not limited	
Kimo-----	25	Very limited Frost action	1.00	Somewhat limited Depth to saturated zone	0.61	Not limited	
		Shrink-swell Flooding	1.00 0.40	Cutbanks cave Too clayey	0.10 0.04		
Gm: Gymer-----	85	Somewhat limited Shrink-swell Frost action	0.50 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Gy: Gymer-----	88	Somewhat limited Shrink-swell Frost action	0.50 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Ju: Judson-----	85	Very limited Frost action Shrink-swell Flooding	1.00 0.50 0.40	Somewhat limited Cutbanks cave	0.10	Not limited	
KA: Kennebec-----	99	Very limited Frost action Flooding	1.00 1.00	Somewhat limited Flooding Depth to saturated zone	0.80 0.61	Very limited Flooding	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10		
Kb: Kennebec-----	95	Very limited Frost action	1.00	Somewhat limited Depth to saturated zone	0.82	Somewhat limited Flooding	0.60
		Flooding Low strength Shrink-swell	1.00 1.00 0.50	Flooding Cutbanks cave	0.60 0.10		
Kc: Kennebec-----	88	Very limited Frost action	1.00	Somewhat limited Depth to saturated zone	0.82	Very limited Flooding	1.00
		Flooding Shrink-swell	1.00 0.50	Flooding Cutbanks cave	0.80 0.10		
Km: Kimo-----	90	Very limited Frost action	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.19
		Shrink-swell Flooding Depth to saturated zone	1.00 0.40 0.19	Too clayey Cutbanks cave	0.12 0.10		
Le: Leanna, drained----	85	Very limited Flooding	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.94
		Shrink-swell Depth to saturated zone	1.00 0.94	Flooding Cutbanks cave	0.60 0.10	Flooding	0.60
				Too clayey	0.02		

BUILDING SITE DEVELOPMENT--Continued  
Douglas County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
M-W: Miscellaneous Water-	100	Not rated		Not rated		Not rated	
Mb: Martin-----	90	Very limited Frost action	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.19
		Shrink-swell Depth to saturated zone	1.00 0.19	Too clayey Cutbanks cave	0.32 0.10		
Mc: Martin-----	85	Very limited Frost action	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.19
		Shrink-swell Depth to saturated zone	1.00 0.19	Too clayey Cutbanks cave	0.32 0.10		
Mh: Martin, eroded----	85	Very limited Frost action Shrink-swell	1.00 1.00	Somewhat limited Too clayey Cutbanks cave	0.32 0.10	Not limited	
Mo: Martin-----	40	Very limited Frost action	1.00	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.19
		Shrink-swell Depth to saturated zone	1.00 0.19	Too clayey Cutbanks cave	0.32 0.10		
Oska-----	30	Very limited Shrink-swell	1.00	Very limited Depth to hard bedrock	1.00	Somewhat limited Depth to bedrock	0.01
		Frost action Depth to hard bedrock	0.50 0.01	Too clayey Cutbanks cave	0.41 0.10		
Mr: Morrill-----	90	Somewhat limited Shrink-swell Frost action	0.50 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Ms: Morrill-----	85	Somewhat limited Shrink-swell Frost action Slope	0.50 0.50 0.16	Somewhat limited Slope Cutbanks cave	0.16 0.10	Somewhat limited Slope	0.16
Oe: Oska-----	88	Very limited Shrink-swell	1.00	Very limited Depth to hard bedrock	1.00	Somewhat limited Depth to bedrock	0.01
		Frost action Depth to hard bedrock	0.50 0.01	Too clayey Cutbanks cave	0.41 0.10		
Pb: Pawnee-----	90	Very limited Frost action	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Shrink-swell Depth to saturated zone	1.00 1.00	Too clayey Cutbanks cave	0.12 0.10		
Pc: Pawnee-----	85	Very limited Frost action	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Shrink-swell Depth to saturated zone	1.00 1.00	Too clayey Cutbanks cave	0.12 0.10		
Ph: Pawnee, eroded----	90	Very limited Frost action	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Shrink-swell Depth to saturated zone	1.00 1.00	Too clayey Cutbanks cave	0.12 0.10		
QUA: Quarries-----	100	Not rated		Not rated		Not rated	

BUILDING SITE DEVELOPMENT--Continued  
Douglas County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Re: Reading-----	90	Very limited Frost action Low strength Shrink-swell Flooding	1.00 1.00 0.50 0.40	Somewhat limited Cutbanks cave Too clayey	0.10 0.02	Not limited	
Ro: River Wash-----	100	Not rated		Not rated		Not rated	
Sa: Sand Pit-----	100	Not rated		Not rated		Not rated	
Sb: Sarpy-----	55	Very limited Flooding	1.00	Very limited Cutbanks cave Flooding	1.00 0.60	Somewhat limited Droughty Flooding	0.69 0.60
Eudora-----	45	Very limited Frost action Flooding	1.00 1.00	Somewhat limited Flooding Cutbanks cave	0.60 0.10	Somewhat limited Flooding	0.60
Sc: Sharpsburg-----	88	Very limited Frost action Shrink-swell	1.00 1.00	Somewhat limited Cutbanks cave	0.10	Not limited	
Sd: Sharpsburg-----	85	Very limited Frost action Shrink-swell	1.00 1.00	Somewhat limited Cutbanks cave	0.10	Not limited	
Sh: Sibleyville-----	90	Somewhat limited Frost action	0.50	Somewhat limited Depth to soft bedrock Cutbanks cave	0.71 0.10	Somewhat limited Depth to bedrock	0.71
So: Sibleyville, eroded-	85	Somewhat limited Frost action	0.50	Somewhat limited Depth to soft bedrock Cutbanks cave	0.71 0.10	Somewhat limited Depth to bedrock	0.71
Ss: Sibleyville-----	60	Somewhat limited Frost action	0.50	Somewhat limited Depth to soft bedrock Cutbanks cave	0.29 0.10	Somewhat limited Depth to bedrock	0.29
St: Sibleyville, eroded-	50	Somewhat limited Frost action	0.50	Somewhat limited Depth to soft bedrock Cutbanks cave	0.71 0.10	Somewhat limited Depth to bedrock	0.71
SU: Summit-----	90	Very limited Shrink-swell Depth to saturated zone	1.00 0.19	Very limited Depth to saturated zone Too clayey Cutbanks cave	1.00 0.50 0.10	Somewhat limited Depth to saturated zone	0.19
Sv: Sibleyville-----	50	Somewhat limited Frost action Slope	0.50 0.37	Somewhat limited Depth to soft bedrock Slope Cutbanks cave	0.71 0.37 0.10	Somewhat limited Depth to bedrock Slope	0.71 0.37
SVV: Sibleyville-----	45	Somewhat limited Frost action	0.50	Somewhat limited Depth to soft bedrock Cutbanks cave	0.54 0.10	Somewhat limited Depth to bedrock	0.54
Vinland-----	35	Somewhat limited Depth to soft bedrock Frost action	1.00 0.50	Very limited Depth to soft bedrock Cutbanks cave	1.00 0.10	Very limited Depth to bedrock	1.00



BUILDING SITE DEVELOPMENT--Continued  
Douglas County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Sw: Sogn-----	55	Very limited Depth to hard bedrock Slope Shrink-swell Frost action	1.00 0.84 0.50 0.50	Very limited Depth to hard bedrock Slope Cutbanks cave	1.00 0.84 0.10	Very limited Depth to bedrock Droughty Slope Content of large stones	1.00 0.92 0.84 0.00
Vinland-----	30	Somewhat limited Depth to soft bedrock Shrink-swell Frost action Slope	1.00 0.50 0.50 0.37	Very limited Depth to soft bedrock Slope Cutbanks cave	1.00 0.37 0.10	Very limited Depth to bedrock Slope Droughty	1.00 0.37 0.11
Sx: Rock Outcrop-----	60	Not rated		Not rated		Not rated	
Vinland-----	26	Very limited Slope  Depth to soft bedrock Shrink-swell Frost action	1.00  1.00 0.50 0.50	Very limited Depth to soft bedrock Slope Cutbanks cave	1.00 1.00 0.10	Very limited Depth to bedrock Slope Droughty	1.00 1.00 0.11
Tc: Thurman-----	35	Not limited		Very limited Cutbanks cave	1.00	Somewhat limited Droughty	0.02
VA: Verdigris-----	88	Very limited Flooding Shrink-swell	1.00 0.50	Somewhat limited Flooding Cutbanks cave	0.80 0.10	Very limited Flooding	1.00
Vc: Vinland-----	50	Somewhat limited Depth to soft bedrock Low strength Shrink-swell Frost action	1.00 0.78 0.50 0.50	Very limited Depth to soft bedrock Cutbanks cave	1.00 0.10	Very limited Depth to bedrock Droughty	1.00 0.09
Vh: Vinland-----	60	Somewhat limited Depth to soft bedrock Shrink-swell Frost action	1.00 0.50 0.50	Very limited Depth to soft bedrock Cutbanks cave	1.00 0.10	Very limited Depth to bedrock Droughty	1.00 0.11
Vm: Vinland-----	40	Somewhat limited Depth to soft bedrock Shrink-swell Frost action Slope	1.00 0.50 0.50 0.37	Very limited Depth to soft bedrock Slope Cutbanks cave	1.00 0.37 0.10	Very limited Depth to bedrock Slope Droughty	1.00 0.37 0.11
Martin-----	25	Very limited Frost action  Shrink-swell Depth to saturated zone Slope	1.00  1.00 0.19 0.04	Very limited Depth to saturated zone Too clayey Cutbanks cave Slope	1.00 0.32 0.10 0.04	Somewhat limited Depth to saturated zone Slope	0.19 0.04
W: Water (< 40 Acres)--	100	Very limited Slope Low strength	1.00 1.00	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
Wc: Wabash-----	88	Very limited Shrink-swell  Depth to saturated zone Flooding Frost action	1.00  1.00 1.00 0.50	Very limited Depth to saturated zone Flooding Too clayey Cutbanks cave	1.00 0.60 0.50 0.10	Very limited Depth to saturated zone Flooding	1.00 0.60

BUILDING SITE DEVELOPMENT--Continued  
Douglas County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Wh: Wabash-----	90	Very limited Shrink-swell	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Flooding	0.60	Too clayey	1.00
		Flooding	1.00	Too clayey	0.50	Flooding	0.60
		Frost action	0.50	Cutbanks cave	0.10		
Wo: Woodson-----	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Frost action	1.00	Too clayey	0.50		
		Shrink-swell	1.00	Cutbanks cave	0.10		
Ws: Woodson-----	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Frost action	1.00	Too clayey	0.50		
		Shrink-swell	1.00	Cutbanks cave	0.10		
Wx: Woodson, eroded----	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Frost action	1.00	Too clayey	0.50		
		Shrink-swell	1.00	Cutbanks cave	0.10		

CONSTRUCTION MATERIALS  
Douglas County, Kansas

### Construction Materials

The following tables give information about the soils as potential sources of gravel, sand, topsoil, reclamation material, and roadfill. Normal compaction, minor processing, and other standard construction practices are assumed.

The soils are rated good, fair, or poor as potential sources of topsoil, reclamation material, and roadfill. The features that limit the soils as sources of these materials are specified in the tables. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of topsoil, reclamation material, or roadfill. The lower the number, the greater the limitation.

The soils are rated as a probable or improbable source of sand and gravel. A rating of probable means that the source material is likely to be in or below the soil. The numerical ratings in these columns indicate the degree of probability. The number 0.00 indicates that the soil is an improbable source. A number between 0.00 and 1.00 indicates the degree to which the soil is a probable source of sand or gravel.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In these tables, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the lowest layer of the soil contains sand or gravel, the soil is rated as a probable source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Reclamation material is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

CONSTRUCTION MATERIALS--Continued  
Douglas County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
059BC: Bates-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.03
059BD: Bates-----	60	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.03
Collinsville-----	25	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
059BH: Bates-----	50	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.03
Collinsville-----	35	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
059BS: Bolivar-----	50	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Hector-----	40	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
059CM: Clareson-----	55	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Eram-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
059DN: Dennis-----	60	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Bates-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.03
059EA: Eram-----	55	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Lebo-----	35	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
059EC: Eram-----	60	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Lula-----	25	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
059LN: Lebo-----	75	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Rock Outcrop-----	15	Not rated		Not rated	

CONSTRUCTION MATERIALS--Continued  
Douglas County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
059MB: Mason-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
059OS: Osage-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
059VB: Verdigris-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
087EC: Eudora-----	65	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Bismarckgrove-----	20	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.00 0.22
087FU: Fluvaquents-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
087MU: Muscotah-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
091EB: Eudora-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
091MC: Morrill-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
139CM: Clareson-----	55	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Eram-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
139ED: Elmont-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
139LU: Lula-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
177MF: Martin-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
177SW: Stony Steep Land---	60	Not rated		Not rated	
Vinland-----	26	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00

CONSTRUCTION MATERIALS--Continued  
Douglas County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
601KW: Konawa-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
601SA: Sarpy-----	55	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.50 0.50
Haynie-----	35	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.01
2326: Kenoma-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
2540: Leanna-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
2797: Morrill, stony-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.00 0.04
3460: Sibleyville-----	50	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.01
Vinland-----	35	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
3461: Sibleyville, eroded-	85	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.01
3462: Sibleyville-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.01
3464: Sibleyville-----	50	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Vinland-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
3494: Summit-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
3495: Summit-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
3815: Verdigris-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
3926: Water (less Than 40-	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00

CONSTRUCTION MATERIALS--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
3951: Woodson-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
AED: Arents, Earthen Dam-	100	Not rated		Not rated	
Be: Basehor-----	50	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
BOP: Borrow Pits-----	100	Not rated		Not rated	
Et: Eudora-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ev: Eudora-----	60	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Kimo-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ew: Eudora-----	65	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.10
Kimo-----	25	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.08
Gm: Gymer-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Gy: Gymer-----	88	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ju: Judson-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
KA: Kennebec-----	99	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Kb: Kennebec-----	95	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Kc: Kennebec-----	88	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Km: Kimo-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00

CONSTRUCTION MATERIALS--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Le: Leanna-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
M-W: Miscellaneous Water-	100	Not rated		Not rated	
Mb: Martin-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Mc: Martin-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Mh: Martin, eroded-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Mo: Martin-----	40	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Oska-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Mr: Morrill-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ms: Morrill-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Oe: Oska-----	88	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Pb: Pawnee-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Pc: Pawnee-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ph: Pawnee, eroded-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
QUA: Quarries-----	100	Not rated		Not rated	
Re: Reading-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ro: River Wash-----	100	Not rated		Not rated	
Sa: Sand Pit-----	100	Not rated		Not rated	



CONSTRUCTION MATERIALS--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Sb: Sarpy-----	55	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.50 0.50
Eudora-----	45	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.08
Sc: Sharpsburg-----	88	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Sd: Sharpsburg-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Sh: Sibleyville-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.01
So: Sibleyville, eroded-	85	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.01
Ss: Sibleyville-----	60	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.01
St: Sibleyville, eroded-	50	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.01
SU: Summit-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Sv: Sibleyville-----	50	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.01
SVV: Sibleyville-----	45	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Vinland-----	35	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Sw: Sogn-----	55	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Vinland-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Sx: Rock Outcrop-----	60	Not rated		Not rated	
Vinland-----	26	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Tc: Thurman-----	35	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.22 0.90

CONSTRUCTION MATERIALS--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
VA: Verdigris-----	88	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Vc: Vinland-----	50	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Vh: Vinland-----	60	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Vm: Vinland-----	40	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Martin-----	25	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
W: Water (< 40 Acres)--	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Wc: Wabash-----	88	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Wh: Wabash-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Wo: Woodson-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ws: Woodson-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Wx: Woodson, eroded----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00

CONSTRUCTION MATERIALS--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
059BC: Bates-----	90	Fair Depth to bedrock Too acid	0.58 0.84	Poor Depth to bedrock	0.00	Fair Depth to bedrock	0.58
059BD: Bates-----	60	Fair Too acid Depth to bedrock	0.84 0.99	Poor Depth to bedrock	0.00	Fair Depth to bedrock	0.99
Collinsville-----	25	Poor Depth to bedrock Droughty Too acid	0.00 0.00 0.68	Poor Depth to bedrock	0.00	Poor Depth to bedrock Rock fragments	0.00 0.95
059BH: Bates-----	50	Fair Depth to bedrock Too acid	0.84 0.84	Poor Depth to bedrock	0.00	Fair Depth to bedrock	0.84
Collinsville-----	35	Poor Depth to bedrock Droughty Too acid	0.00 0.00 0.68	Poor Depth to bedrock	0.00	Poor Depth to bedrock Slope Rock fragments	0.00 0.84 0.95
059BS: Bolivar-----	50	Fair Too acid Low content of organic matter Depth to bedrock Droughty	0.54 0.82 0.84 0.93	Poor Depth to bedrock Shrink-swell	0.00 0.99	Fair Depth to bedrock Slope Too acid	0.84 0.96 0.98
Hector-----	40	Poor Droughty Depth to bedrock Too acid	0.00 0.00 0.32	Poor Depth to bedrock	0.00	Poor Depth to bedrock Slope Rock fragments	0.00 0.96 0.97
059CM: Clareson-----	55	Fair Droughty Too clayey Cobble content Depth to bedrock	0.01 0.02 0.19 0.21	Poor Depth to bedrock Cobble content Shrink-swell	0.00 0.00 0.33	Poor Rock fragments Too Clayey Depth to bedrock Slope	0.00 0.02 0.21 0.96
Eram-----	30	Poor Too clayey Too acid Droughty Depth to bedrock No water erosion limitation	0.00 0.95 0.98 0.99 0.99	Poor Depth to bedrock Depth to saturated zone Shrink-swell	0.00 0.00 0.12	Poor Depth to saturated zone Too Clayey Depth to bedrock	0.00 0.00 0.99
059DN: Dennis-----	60	Poor Too clayey Too acid Water erosion	0.00 0.74 0.90	Fair Depth to saturated zone Shrink-swell	0.04 0.18	Poor Too Clayey Depth to saturated zone	0.00 0.04
Bates-----	30	Fair Depth to bedrock Too acid	0.84 0.84	Poor Depth to bedrock	0.00	Fair Depth to bedrock	0.84
059EA: Eram-----	55	Poor Too clayey Too acid Droughty Depth to bedrock No water erosion limitation	0.00 0.95 0.98 0.99 0.99	Poor Depth to bedrock Depth to saturated zone Shrink-swell	0.00 0.00 0.12	Poor Depth to saturated zone Too Clayey Slope Depth to bedrock	0.00 0.00 0.84 0.99

CONSTRUCTION MATERIALS--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Lebo-----	35	Fair Depth to bedrock Droughty	0.35 0.96	Poor Depth to bedrock Shrink-swell	0.00 0.87	Fair Depth to bedrock Slope	0.35 0.84
059EC: Eram-----	60	Poor Too clayey  Too acid  Droughty Depth to bedrock No water erosion limitation	0.00  0.95  0.98 0.99 0.99	Poor Depth to bedrock  Depth to saturated zone Shrink-swell	0.00  0.00 0.12	Poor Depth to saturated zone Too Clayey Depth to bedrock	0.00  0.00 0.99
Lula-----	25	Fair Low content of organic matter Too clayey Too acid No water erosion limitation	0.32  0.68 0.95 0.99	Fair Depth to bedrock  Shrink-swell	0.12  0.15	Fair Too Clayey  Hard to reclaim Rock fragments	0.42  0.50 0.50
059LN: Lebo-----	75	Fair Droughty Depth to bedrock	0.04 0.35	Poor Depth to bedrock Slope Shrink-swell	0.00 0.00 0.87	Poor Slope Rock fragments Depth to bedrock	0.00 0.00 0.35
Rock Outcrop-----	15	Not rated		Not rated		Not rated	
059MB: Mason-----	90	Fair Low content of organic matter Too acid No water erosion limitation	0.88  0.97 0.99	Fair Shrink-swell	0.87	Good	
059OS: Osage-----	85	Poor Too clayey  Too acid No water erosion limitation	0.00  0.97 0.99	Poor Depth to saturated zone Shrink-swell	0.00 0.00	Poor Depth to saturated zone Too Clayey	0.00 0.00
059VB: Verdigris-----	85	Good		Fair Shrink-swell	0.90	Good	
087EC: Eudora-----	65	Fair Low content of organic matter Water erosion	0.32  0.90	Good		Good	
Bismarckgrove-----	20	Fair Water erosion Too clayey	0.90 0.92	Good		Fair Too Clayey	0.92
087FU: Fluvaquents-----	100	Poor Low content of organic matter No water erosion limitation	0.00  0.99	Fair Depth to saturated zone	0.80	Fair Depth to saturated zone	0.80
087MU: Muscotah-----	85	Poor Too clayey Too acid  No water erosion limitation	0.00 0.97  0.99	Fair Shrink-swell Depth to saturated zone	0.12 0.76	Poor Too Clayey Depth to saturated zone	0.00 0.76

CONSTRUCTION MATERIALS--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
091EB: Eudora-----	85	Fair Low content of organic matter Water erosion	0.08 0.90	Good		Good	
091MC: Morrill-----	85	Fair Low content of organic matter Too acid No water erosion limitation	0.50 0.97 0.99	Fair Shrink-swell	0.90	Fair Rock fragments	0.88
139CM: Clareson-----	55	Fair Droughty Depth to bedrock Cobble content Too clayey	0.01 0.10 0.47 0.68	Poor Depth to bedrock Cobble content Shrink-swell	0.00 0.21 0.44	Poor Rock fragments Depth to bedrock Too Clayey Slope	0.00 0.10 0.67 0.96
Eram-----	30	Poor Too clayey  Depth to bedrock  Droughty Too acid No water erosion limitation	0.00  0.35  0.40 0.95 0.99	Poor Depth to bedrock  Depth to saturated zone Shrink-swell	0.00  0.00 0.12	Poor Depth to saturated zone Too Clayey Depth to bedrock	0.00  0.00 0.35
139ED: Elmont-----	85	Fair Water erosion Too acid Too clayey	0.90 0.97 0.98	Fair Depth to bedrock Shrink-swell	0.74 0.91	Fair Too Clayey	0.81
139LU: Lula-----	85	Fair Low content of organic matter Too clayey Too acid No water erosion limitation	0.32 0.68 0.95 0.99	Fair Depth to bedrock  Shrink-swell	0.12  0.87	Fair Too Clayey  Hard to reclaim Rock fragments	0.42  0.50 0.50
177MF: Martin-----	90	Poor Too clayey Too acid  No water erosion limitation	0.00 0.95  0.99	Fair Shrink-swell Depth to saturated zone	0.21 0.50	Poor Too Clayey Depth to saturated zone Slope	0.00 0.50 0.96
177SW: Stony Steep Land----	60	Not rated		Not rated		Not rated	
Vinland-----	26	Poor Depth to bedrock Droughty Water erosion Too clayey	0.00 0.11 0.90 0.98	Poor Depth to bedrock Slope Shrink-swell	0.00 0.00 0.87	Poor Depth to bedrock Slope Rock fragments Too Clayey	0.00 0.00 0.97 0.98
601KW: Konawa-----	90	Fair Low content of organic matter Too acid Too clayey	0.32 0.54 0.92	Fair Shrink-swell	0.95	Fair Slope  Too Clayey Too acid	0.04  0.57 0.98
601SA: Sarpy-----	55	Poor Too sandy Wind erosion Low content of organic matter Droughty	0.00 0.00 0.18 0.35	Good		Poor Too sandy	0.00

CONSTRUCTION MATERIALS--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Haynie-----	35	Fair Low content of organic matter Carbonate content No water erosion limitation	0.18 0.97 0.99	Good		Fair Carbonate content	0.97
2326: Kenoma-----	90	Poor Too clayey Low content of organic matter Too acid Water erosion	0.00 0.50 0.61 0.90	Poor Low strength Depth to saturated zone Shrink-swell	0.00 0.00 0.12	Poor Too Clayey Depth to saturated zone	0.00 0.00
2540: Leanna-----	85	Poor Too clayey  Too acid No water erosion limitation	0.00  0.84 0.99	Poor Depth to saturated zone Low strength Shrink-swell	0.00 0.00 0.28	Poor Depth to saturated zone Too Clayey	0.00 0.00
2797: Morrill, stony-----	85	Fair Too clayey Low content of organic matter Too acid	0.68 0.88 0.97	Fair Shrink-swell	0.99	Fair Too Clayey Rock fragments Slope	0.49 0.76 0.96
3460: Sibleyville-----	50	Fair Depth to bedrock Droughty Low content of organic matter Too acid	0.29 0.57 0.88 0.97	Poor Depth to bedrock	0.00	Fair Depth to bedrock Rock fragments Slope	0.29 0.50 0.63
Vinland-----	35	Poor Depth to bedrock Droughty Water erosion	0.00 0.05 0.90	Poor Depth to bedrock Low strength	0.00 0.22	Poor Depth to bedrock Slope Rock fragments	0.00 0.63 0.97
3461: Sibleyville, eroded-	85	Fair Depth to bedrock Droughty Low content of organic matter Too acid	0.29 0.47 0.88 0.97	Poor Depth to bedrock	0.00	Fair Depth to bedrock Rock fragments	0.29 0.50
3462: Sibleyville-----	85	Fair Depth to bedrock Droughty Low content of organic matter Too acid	0.29 0.57 0.88 0.97	Poor Depth to bedrock	0.00	Fair Depth to bedrock Rock fragments	0.29 0.50
3464: Sibleyville-----	50	Fair Droughty Low content of organic matter Too acid	0.57 0.88 0.97	Good		Fair Rock fragments	0.50
Vinland-----	30	Poor Depth to bedrock Droughty Water erosion	0.00 0.05 0.90	Poor Depth to bedrock Low strength	0.00 0.22	Poor Depth to bedrock Rock fragments	0.00 0.97
3494: Summit-----	85	Poor Too clayey Too acid  Low content of organic matter No water erosion limitation	0.00 0.80  0.82 0.99	Poor Low strength Shrink-swell  Depth to saturated zone	0.00 0.12  0.89	Poor Too Clayey Depth to saturated zone Rock fragments	0.00 0.89 0.97

CONSTRUCTION MATERIALS--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3495: Summit-----	85	Poor Too clayey Low content of organic matter No water erosion limitation	0.00 0.82 0.99	Poor Low strength Shrink-swell Depth to saturated zone	0.00 0.12 0.53	Poor Too Clayey Depth to saturated zone Rock fragments	0.00 0.53 0.97
3815: Verdigris-----	85	Good		Poor Low strength Shrink-swell	0.00 0.87	Good	
3926: Water (less Than 40-	100	Poor Low content of organic matter	0.00	Poor Slope Low strength	0.00 0.00	Poor Slope	0.00
3951: Woodson-----	85	Poor Too clayey Water erosion Too acid	0.00 0.90 0.95	Poor Depth to saturated zone Low strength Shrink-swell	0.00 0.00 0.12	Poor Too Clayey Depth to saturated zone	0.00 0.00
AED: Arents, Earthen Dam-	100	Not rated		Not rated		Not rated	
Be: Basehor-----	50	Poor Droughty Depth to bedrock Too acid Low content of organic matter	0.00 0.00 0.84 0.88	Poor Depth to bedrock	0.00	Poor Depth to bedrock Slope Rock fragments	0.00 0.63 0.95
BOP: Borrow Pits-----	100	Not rated		Not rated		Not rated	
Et: Eudora-----	90	Fair Low content of organic matter Water erosion	0.08 0.90	Good		Good	
Ev: Eudora-----	60	Fair Water erosion	0.90	Good		Good	
Kimo-----	30	Poor Too clayey Low content of organic matter No water erosion limitation	0.00 0.50 0.99	Fair Depth to saturated zone Shrink-swell	0.53 0.97	Poor Too Clayey Depth to saturated zone	0.00 0.53
Ew: Eudora-----	65	Fair Water erosion	0.90	Good		Good	
Kimo-----	25	Fair Low content of organic matter No water erosion limitation	0.18 0.99	Fair		Good	
Gm: Gymer-----	85	Fair Too clayey Low content of organic matter Too acid Water erosion	0.02 0.32 0.84 0.90	Fair Shrink-swell	0.90	Fair Too Clayey	0.02

CONSTRUCTION MATERIALS--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Gy: Gymer-----	88	Fair Too clayey Too acid Low content of organic matter Water erosion	0.02 0.84 0.88 0.90	Fair Shrink-swell	0.90	Fair Too Clayey	0.02
Ju: Judson-----	85	Fair Water erosion	0.90	Fair Shrink-swell	0.92	Good	
KA: Kennebec-----	99	Good		Fair Shrink-swell	0.87	Good	
Kb: Kennebec-----	95	Good		Poor Low strength Shrink-swell	0.00 0.87	Good	
Kc: Kennebec-----	88	Fair Water erosion	0.90	Fair Shrink-swell	0.87	Good	
Km: Kimo-----	90	Poor Too clayey  Low content of organic matter No water erosion limitation	0.00 0.50 0.99	Fair Depth to saturated zone Shrink-swell	0.53 0.97	Poor Too Clayey  Depth to saturated zone	0.00 0.53
Le: Leanna, drained----	85	Fair Too acid  Low content of organic matter No water erosion limitation	0.84 0.92 0.99	Fair Depth to saturated zone Shrink-swell	0.04 0.38	Fair Depth to saturated zone	0.04
M-W: Miscellaneous Water-	100	Not rated		Not rated		Not rated	
Mb: Martin-----	90	Poor Too clayey Too acid  No water erosion limitation	0.00 0.95 0.99	Fair Shrink-swell Depth to saturated zone	0.17 0.53	Poor Too Clayey Depth to saturated zone	0.00 0.53
Mc: Martin-----	85	Poor Too clayey Low content of organic matter Too acid No water erosion limitation	0.00 0.88 0.95 0.99	Fair Shrink-swell Depth to saturated zone	0.17 0.53	Poor Too Clayey Depth to saturated zone	0.00 0.53
Mh: Martin, eroded-----	85	Poor Too clayey Too acid No water erosion limitation	0.00 0.95 0.99	Fair Shrink-swell	0.17	Poor Too Clayey	0.00
Mo: Martin-----	40	Poor Too clayey Too acid  No water erosion limitation	0.00 0.95 0.99	Fair Shrink-swell Depth to saturated zone	0.17 0.53	Poor Too Clayey Depth to saturated zone	0.00 0.53



CONSTRUCTION MATERIALS--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Oska-----	30	Poor Too clayey Too acid Depth to bedrock No water erosion limitation	0.00 0.95 0.99 0.99	Poor Depth to bedrock Shrink-swell	0.00 0.12	Poor Too Clayey Depth to bedrock	0.00 0.99
Mr: Morrill-----	90	Fair Low content of organic matter Too clayey Too acid	0.88 0.92 0.97	Fair Shrink-swell	0.87	Fair Too Clayey Rock fragments	0.66 0.88
Ms: Morrill-----	85	Fair Low content of organic matter Too clayey Too acid	0.88 0.92 0.97	Fair Shrink-swell	0.87	Fair Too Clayey Slope Rock fragments	0.66 0.84 0.88
Oe: Oska-----	88	Poor Too clayey Too acid Depth to bedrock No water erosion limitation	0.00 0.95 0.99 0.99	Poor Depth to bedrock Shrink-swell	0.00 0.12	Poor Too Clayey Depth to bedrock	0.00 0.99
Pb: Pawnee-----	90	Poor Too clayey Low content of organic matter No water erosion limitation	0.00 0.08 0.99	Poor Depth to saturated zone Shrink-swell	0.00 0.17	Poor Too Clayey Depth to saturated zone	0.00 0.00
Pc: Pawnee-----	85	Poor Too clayey Low content of organic matter No water erosion limitation	0.00 0.08 0.99	Poor Depth to saturated zone Shrink-swell	0.00 0.17	Poor Too Clayey Depth to saturated zone	0.00 0.00
Ph: Pawnee, eroded-----	90	Poor Too clayey Low content of organic matter No water erosion limitation	0.00 0.08 0.99	Poor Depth to saturated zone Shrink-swell	0.00 0.17	Poor Too Clayey Depth to saturated zone	0.00 0.00
QUA: Quarries-----	100	Not rated		Not rated		Not rated	
Re: Reading-----	90	Fair Water erosion Too acid Too clayey	0.90 0.95 0.98	Poor Low strength Shrink-swell	0.00 0.90	Fair Too Clayey	0.89
Ro: River Wash-----	100	Not rated		Not rated		Not rated	
Sa: Sand Pit-----	100	Not rated		Not rated		Not rated	

CONSTRUCTION MATERIALS--Continued  
Douglas County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Sb: Sarpy-----	55	Poor Too sandy Wind erosion Low content of organic matter Droughty	0.00 0.00 0.12 0.35	Good		Poor Too sandy	0.00
Eudora-----	45	Fair Water erosion	0.90	Good		Good	
Sc: Sharpsburg-----	88	Fair Too clayey Low content of organic matter Too acid Water erosion	0.02 0.50 0.74 0.90	Fair Shrink-swell	0.51	Fair Too Clayey	0.02
Sd: Sharpsburg-----	85	Fair Too clayey Low content of organic matter Too acid Water erosion	0.02 0.50 0.74 0.90	Fair Shrink-swell	0.51	Fair Too Clayey	0.02
Sh: Sibleyville-----	90	Fair Depth to bedrock Droughty Low content of organic matter Too acid	0.29 0.57 0.88 0.97	Poor Depth to bedrock	0.00	Fair Depth to bedrock Rock fragments	0.29 0.50
So: Sibleyville, eroded-	85	Fair Depth to bedrock Droughty Low content of organic matter Too acid	0.29 0.47 0.88 0.97	Poor Depth to bedrock	0.00	Fair Depth to bedrock Rock fragments	0.29 0.50
Ss: Sibleyville-----	60	Fair Droughty Depth to bedrock Low content of organic matter Too acid	0.57 0.71 0.88 0.97	Poor Depth to bedrock	0.00	Fair Rock fragments Depth to bedrock	0.50 0.71
St: Sibleyville, eroded-	50	Fair Depth to bedrock Droughty Low content of organic matter Too acid	0.29 0.57 0.88 0.97	Poor Depth to bedrock	0.00	Fair Depth to bedrock Rock fragments	0.29 0.50
SU: Summit-----	90	Poor Too clayey No water erosion limitation	0.00 0.99	Fair Shrink-swell Depth to saturated zone	0.12 0.53	Poor Too Clayey Depth to saturated zone Rock fragments	0.00 0.53 0.97
Sv: Sibleyville-----	50	Fair Depth to bedrock Droughty Low content of organic matter Too acid	0.29 0.57 0.88 0.97	Poor Depth to bedrock	0.00	Fair Depth to bedrock Rock fragments Slope	0.29 0.50 0.63
SVV: Sibleyville-----	45	Fair Depth to bedrock Droughty Too acid	0.46 0.86 0.97	Poor Depth to bedrock	0.00	Fair Depth to bedrock	0.46

CONSTRUCTION MATERIALS--Continued  
Douglas County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Vinland-----	35	Poor Depth to bedrock Droughty Too clayey	0.00 0.34 0.98	Poor Depth to bedrock	0.00	Poor Depth to bedrock Rock fragments Too Clayey	0.00 0.97 0.98
Sw: Sogn-----	55	Poor Droughty Depth to bedrock Too clayey	0.00 0.00 0.98	Poor Depth to bedrock Shrink-swell	0.00 0.87	Poor Depth to bedrock Slope Too Clayey	0.00 0.16 0.93
Vinland-----	30	Poor Depth to bedrock Droughty Low content of organic matter Water erosion Too clayey	0.00 0.07 0.88 0.90 0.92	Poor Depth to bedrock Shrink-swell	0.00 0.87	Poor Depth to bedrock Slope Too Clayey Rock fragments	0.00 0.63 0.66 0.97
Sx: Rock Outcrop-----	60	Not rated		Not rated		Not rated	
Vinland-----	26	Poor Depth to bedrock Droughty Low content of organic matter Water erosion Too clayey	0.00 0.07 0.88 0.90 0.92	Poor Depth to bedrock Slope Shrink-swell	0.00 0.00 0.87	Poor Slope Depth to bedrock Too Clayey Rock fragments	0.00 0.00 0.66 0.97
Tc: Thurman-----	35	Poor Wind erosion Low content of organic matter Too sandy Droughty	0.00 0.18 0.22 0.81	Good		Fair Too sandy	0.22
VA: Verdigris-----	88	Good		Fair Shrink-swell	0.87	Good	
Vc: Vinland-----	50	Poor Depth to bedrock Droughty Water erosion Too clayey	0.00 0.08 0.90 0.98	Poor Depth to bedrock Low strength Shrink-swell	0.00 0.22 0.87	Poor Depth to bedrock Rock fragments Too Clayey	0.00 0.97 0.98
Vh: Vinland-----	60	Poor Depth to bedrock Droughty Low content of organic matter Water erosion Too clayey	0.00 0.07 0.88 0.90 0.92	Poor Depth to bedrock Shrink-swell	0.00 0.87	Poor Depth to bedrock Too Clayey Rock fragments	0.00 0.66 0.97
Vm: Vinland-----	40	Poor Depth to bedrock Droughty Low content of organic matter Water erosion Too clayey	0.00 0.07 0.88 0.90 0.92	Poor Depth to bedrock Shrink-swell	0.00 0.87	Poor Depth to bedrock Slope Too Clayey Rock fragments	0.00 0.63 0.66 0.97
Martin-----	25	Poor Too clayey Too acid  No water erosion limitation	0.00 0.95 0.99	Fair Shrink-swell Depth to saturated zone	0.17 0.53	Poor Too Clayey Depth to saturated zone Slope	0.00 0.53 0.96
W: Water (< 40 Acres)--	100	Poor Low content of organic matter	0.00	Poor Slope  Low strength	0.00 0.00	Poor Slope	0.00

CONSTRUCTION MATERIALS--Continued  
Douglas County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Wc: Wabash-----	88	Poor Too clayey	0.00	Poor Depth to saturated zone Shrink-swell	0.00 0.00	Poor Too Clayey Depth to saturated zone	0.00 0.00
Wh: Wabash-----	90	Poor Too clayey	0.00	Poor Depth to saturated zone Shrink-swell	0.00 0.00	Poor Too Clayey Depth to saturated zone	0.00 0.00
Wo: Woodson-----	90	Poor Too clayey Water erosion Too acid	0.00 0.90 0.95	Poor Depth to saturated zone Shrink-swell	0.00 0.15	Poor Too Clayey Depth to saturated zone	0.00 0.00
Ws: Woodson-----	90	Poor Too clayey Water erosion Too acid	0.00 0.90 0.95	Poor Depth to saturated zone Shrink-swell	0.00 0.15	Poor Too Clayey Depth to saturated zone	0.00 0.00
Wx: Woodson, eroded----	90	Poor Too clayey Too acid No water erosion limitation	0.00 0.95 0.99	Poor Depth to saturated zone Shrink-swell	0.00 0.12	Poor Too Clayey Depth to saturated zone	0.00 0.00

RECREATIONAL INTERPRETATIONS  
Douglas County, Kansas

## Recreation

The soils of the survey area are rated in the following tables according to limitations that affect their suitability for recreation. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. Not limited indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. Slightly limited indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. Somewhat limited indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. Very limited indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings in the tables are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

The information in this table can be supplemented by other information in this survey, for example, interpretations for building site development, construction materials, sanitary facilities, and water management.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas.

The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Playgrounds require soils that are nearly level, are free of stones, and can withstand intensive foot traffic. The ratings are based on the soil properties that affect the ease of developing playgrounds and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of playgrounds. For good trafficability, the surface of the playgrounds should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Paths and trails for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer. The suitability of the soil for traps, tees, roughs, and greens is not considered in the ratings.

RECREATIONAL INTERPRETATIONS--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
059BC: Bates-----	90	Not limited		Not limited		Somewhat limited Depth to bedrock Slope	0.42 0.13
059BD: Bates-----	60	Not limited		Not limited		Somewhat limited Slope Depth to bedrock	0.87 0.01
Collinsville-----	25	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Slope Content of large stones	1.00 0.87 0.03
059BH: Bates-----	50	Somewhat limited Slope	0.00	Somewhat limited Slope	0.00	Very limited Slope Depth to bedrock	1.00 0.16
Collinsville-----	35	Very limited Depth to bedrock Slope	1.00 0.16	Very limited Depth to bedrock Slope	1.00 0.16	Very limited Slope Depth to bedrock Content of large stones	1.00 1.00 0.03
059BS: Bolivar-----	50	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04	Very limited Slope Depth to bedrock	1.00 0.16
Hector-----	40	Very limited Depth to bedrock Slope	1.00 0.04	Very limited Depth to bedrock Slope	1.00 0.04	Very limited Depth to bedrock Slope Gravel content	1.00 1.00 0.06
059CM: Clareson-----	55	Somewhat limited Restricted permeability Slope	0.94 0.04	Somewhat limited Restricted permeability Slope	0.94 0.04	Very limited Slope Restricted permeability Depth to bedrock Content of large stones	1.00 0.94 0.80 0.20
Eram-----	30	Very limited Depth to saturated zone Restricted permeability Slope	1.00 0.94 0.00	Very limited Depth to saturated zone Restricted permeability Slope	1.00 0.94 0.00	Very limited Depth to saturated zone Slope Restricted permeability Depth to bedrock	1.00 1.00 0.94 0.01
059DN: Dennis-----	60	Very limited Depth to saturated zone Restricted permeability	1.00 0.94	Somewhat limited Restricted permeability Depth to saturated zone	0.94 0.94	Very limited Depth to saturated zone Restricted permeability Slope Somewhat limited Slope Depth to bedrock	1.00 0.94 0.50 0.50 0.16
Bates-----	30	Not limited		Not limited			
059EA: Eram-----	55	Very limited Depth to saturated zone Restricted permeability Slope	1.00 0.96 0.16	Very limited Depth to saturated zone Restricted permeability Slope	1.00 0.96 0.16	Very limited Depth to saturated zone Slope Restricted permeability Depth to bedrock	1.00 1.00 0.96 0.01
Lebo-----	35	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Slope Depth to bedrock	1.00 0.65
059EC: Eram-----	60	Very limited Depth to saturated zone Restricted permeability	1.00 0.94	Very limited Depth to saturated zone Restricted permeability	1.00 0.94	Very limited Depth to saturated zone Restricted permeability Slope Depth to bedrock	1.00 0.94 0.87 0.01
Lula-----	25	Not limited		Not limited		Somewhat limited Slope	0.50
059LN: Lebo-----	75	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00

RECREATIONAL INTERPRETATIONS--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
		Content of large stones	0.14	Content of large stones	0.14	Content of large stones	1.00
Rock Outcrop-----	15	Not rated		Not rated		Gravel content	0.90
059MB: Mason-----	90	Very limited Flooding	1.00	Somewhat limited Restricted permeability	0.15	Depth to bedrock	0.65
		Restricted permeability	0.15			Not rated	
059OS: Osage-----	85	Very limited Depth to saturated zone Flooding	1.00	Very limited Depth to saturated zone Restricted permeability	1.00	Somewhat limited Restricted permeability	0.15
		Restricted permeability	1.00				
059VB: Verdigris-----	85	Very limited Flooding	1.00	Not limited		Very limited Depth to saturated zone Restricted permeability Flooding	1.00
087EC: Eudora-----	65	Very limited Flooding	1.00	Not limited			0.60
Bismarckgrove-----	20	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
087FU: Fluvaquents-----	100	Very limited Flooding Depth to saturated zone	1.00 0.03	Somewhat limited Flooding Depth to saturated zone	0.40 0.02	Somewhat limited Flooding	0.60
087MU: Muscotah-----	85	Very limited Flooding	1.00	Very limited Restricted permeability Depth to saturated zone	1.00 0.03	Very limited Flooding Depth to saturated zone	1.00 0.03
		Restricted permeability Depth to saturated zone	1.00 0.07			Very limited Restricted permeability Depth to saturated zone	1.00 0.07
091EB: Eudora-----	85	Very limited Flooding	1.00	Not limited		Not limited	
091MC: Morrill-----	85	Somewhat limited Restricted permeability	0.15	Somewhat limited Restricted permeability	0.15	Very limited Slope	1.00
						Restricted permeability	0.15
139CM: Clareson-----	55	Somewhat limited Restricted permeability Slope	0.84 0.04	Somewhat limited Restricted permeability Slope	0.84 0.04	Gravel content	0.06
						Very limited Slope	1.00
Eram-----	30	Very limited Depth to saturated zone Restricted permeability Slope	1.00 0.94 0.00	Very limited Depth to saturated zone Restricted permeability Slope	1.00 0.94 0.00	Depth to bedrock	0.90
139ED: Elmont-----	85	Somewhat limited Restricted permeability	0.15	Somewhat limited Restricted permeability	0.15	Restricted permeability Content of large stones	0.84
						Very limited Depth to saturated zone Slope	0.20
139LU: Lula-----	85	Not limited		Not limited		Restricted permeability Depth to bedrock	1.00
177MF: Martin-----	90	Somewhat limited Restricted permeability	0.94	Somewhat limited Restricted permeability	0.94		1.00
						Somewhat limited Slope	0.87
						Restricted permeability	0.15
						Somewhat limited Slope	0.00
						Very limited Slope	1.00

RECREATIONAL INTERPRETATIONS--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
		Depth to saturated zone Slope	0.44 0.04	Depth to saturated zone Slope	0.22 0.04	Restricted permeability Depth to saturated zone	0.94 0.44
177SW: Stony Steep Land----	60	Not rated		Not rated		Not rated	
Vinland-----	26	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Slope Depth to bedrock Gravel content	1.00 1.00 0.04
601KW: Konawa-----	90	Somewhat limited Slope	0.96	Somewhat limited Slope	0.96	Very limited Slope	1.00
601SA: Sarpy-----	55	Very limited Flooding Too sandy	1.00 0.88	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy Flooding Slope	0.88 0.60 0.00
Haynie-----	35	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding Slope	0.60 0.00
2326: Kenoma-----	90	Very limited Depth to saturated zone Restricted permeability	1.00 1.00	Very limited Restricted permeability Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Restricted permeability Slope	1.00 1.00 0.13
2540: Leanna-----	85	Very limited Depth to saturated zone Flooding  Restricted permeability	1.00 1.00 1.00	Very limited Depth to saturated zone Restricted permeability	1.00 1.00	Very limited Depth to saturated zone Restricted permeability Flooding	1.00 1.00 0.60
2797: Morrill, stony-----	85	Somewhat limited Restricted permeability Slope	0.15 0.04	Somewhat limited Restricted permeability Slope	0.15 0.04	Very limited Slope  Gravel content Restricted permeability	1.00  0.70 0.15
3460: Sibleyville-----	50	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope Depth to bedrock	1.00 0.71
Vinland-----	35	Very limited Depth to bedrock Slope	1.00 0.37	Very limited Depth to bedrock Slope	1.00 0.37	Very limited Slope Depth to bedrock Gravel content	1.00 1.00 0.04
3461: Sibleyville, eroded-	85	Not limited		Not limited		Somewhat limited Slope Depth to bedrock	0.87 0.71
3462: Sibleyville-----	85	Not limited		Not limited		Somewhat limited Slope Depth to bedrock	0.87 0.71
3464: Sibleyville-----	50	Not limited		Not limited		Somewhat limited Slope	0.87
Vinland-----	30	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Slope Gravel content	1.00 0.87 0.04
3494: Summit-----	85	Somewhat limited Restricted permeability	0.94	Somewhat limited Restricted permeability	0.94	Somewhat limited Restricted permeability Slope	0.94 0.13
3495: Summit-----	85	Somewhat limited Restricted permeability Depth to saturated zone	0.94 0.39	Somewhat limited Restricted permeability Depth to saturated zone	0.94 0.19	Very limited Slope  Restricted permeability Depth to saturated zone	1.00  0.94 0.39



RECREATIONAL INTERPRETATIONS--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3815: Verdigris-----	85	Very limited Flooding	1.00	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
3926: Water (less Than 40-	100	Very limited Slope Restricted permeability	1.00 1.00	Very limited Slope Restricted permeability	1.00 1.00	Very limited Slope Restricted permeability	1.00 1.00
3951: Woodson-----	85	Very limited Depth to saturated zone Restricted permeability	1.00 1.00	Very limited Depth to saturated zone Restricted permeability	1.00 1.00	Very limited Depth to saturated zone Restricted permeability Slope	1.00 1.00 0.00
AED: Arents, Earthen Dam-	100	Not rated		Not rated		Not rated	
Be: Basehor-----	50	Very limited Depth to bedrock Slope	1.00 0.37	Very limited Depth to bedrock Slope	1.00 0.37	Very limited Slope Depth to bedrock Content of large stones	1.00 1.00 0.03
BOP: Borrow Pits-----	100	Not rated		Not rated		Not rated	
Et: Eudora-----	90	Very limited Flooding	1.00	Not limited		Not limited	
Ev: Eudora-----	60	Very limited Flooding	1.00	Not limited		Not limited	
Kimo-----	30	Very limited Flooding  Restricted permeability Depth to saturated zone	1.00  0.94 0.39	Somewhat limited Restricted permeability Depth to saturated zone	0.94 0.19	Somewhat limited Restricted permeability Depth to saturated zone	0.94 0.39
Ew: Eudora-----	65	Very limited Flooding	1.00	Not limited		Not limited	
Kimo-----	25	Very limited Flooding  Restricted permeability	1.00 0.94	Somewhat limited Restricted permeability	0.94	Somewhat limited Restricted permeability	0.94
Gm: Gymer-----	85	Somewhat limited Restricted permeability	0.15	Somewhat limited Restricted permeability	0.15	Somewhat limited Restricted permeability Slope	0.15 0.00
Gy: Gymer-----	88	Somewhat limited Restricted permeability	0.15	Somewhat limited Restricted permeability	0.15	Very limited Slope  Restricted permeability	1.00 0.15
Ju: Judson-----	85	Very limited Flooding	1.00	Not limited		Not limited	
KA: Kennebec-----	99	Very limited Flooding	1.00	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
Kb: Kennebec-----	95	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
Kc: Kennebec-----	88	Very limited Flooding	1.00	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
Km: Kimo-----	90	Very limited Flooding  Restricted permeability Depth to saturated zone	1.00 0.94 0.39	Somewhat limited Restricted permeability Depth to saturated zone	0.94 0.19	Somewhat limited Restricted permeability Depth to saturated zone	0.94 0.39

RECREATIONAL INTERPRETATIONS--Continued  
Douglas County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Le: Leanna-----	85	Very limited Flooding  Restricted permeability Depth to saturated zone	1.00  1.00 1.00	Very limited Restricted permeability Depth to saturated zone	1.00  0.94	Very limited Restricted permeability Depth to saturated zone Flooding	1.00  1.00 0.60
M-W: Miscellaneous Water-	100	Not rated		Not rated		Not rated	
Mb: Martin-----	90	Somewhat limited Restricted permeability Depth to saturated zone	0.94  0.39	Somewhat limited Restricted permeability Depth to saturated zone	0.94  0.19	Somewhat limited Restricted permeability Depth to saturated zone Slope	0.94  0.39 0.00
Mc: Martin-----	85	Somewhat limited Restricted permeability Depth to saturated zone	0.94  0.39	Somewhat limited Restricted permeability Depth to saturated zone	0.94  0.19	Somewhat limited Restricted permeability Slope  Depth to saturated zone	0.94  0.87  0.39
Mh: Martin, eroded-----	85	Somewhat limited Restricted permeability	0.94	Somewhat limited Restricted permeability	0.94	Somewhat limited Restricted permeability Slope	0.94 0.87
Mo: Martin-----	40	Somewhat limited Restricted permeability Depth to saturated zone	0.94  0.39	Somewhat limited Restricted permeability Depth to saturated zone	0.94  0.19	Somewhat limited Restricted permeability Slope  Depth to saturated zone	0.94  0.87  0.39
Oska-----	30	Somewhat limited Restricted permeability	0.94	Somewhat limited Restricted permeability	0.94	Somewhat limited Restricted permeability Slope Depth to bedrock	0.94 0.87 0.01
Mr: Morrill-----	90	Somewhat limited Restricted permeability	0.15	Somewhat limited Restricted permeability	0.15	Somewhat limited Slope  Restricted permeability Gravel content	0.87  0.15 0.06
Ms: Morrill-----	85	Somewhat limited Slope Restricted permeability	0.16 0.15	Somewhat limited Slope Restricted permeability	0.16 0.15	Very limited Slope Restricted permeability Gravel content	1.00 0.15 0.06
Oe: Oska-----	88	Somewhat limited Restricted permeability	0.94	Somewhat limited Restricted permeability	0.94	Somewhat limited Restricted permeability Slope Depth to bedrock	0.94 0.87 0.01
Pb: Pawnee-----	90	Very limited Depth to saturated zone Restricted permeability	1.00  0.94	Very limited Depth to saturated zone Restricted permeability	1.00  0.94	Very limited Depth to saturated zone Restricted permeability Slope	1.00  0.94 0.00
Pc: Pawnee-----	85	Very limited Depth to saturated zone Restricted permeability	1.00  0.94	Very limited Depth to saturated zone Restricted permeability	1.00  0.94	Very limited Depth to saturated zone Restricted permeability Slope	1.00  0.94 0.87
Ph: Pawnee, eroded-----	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00

RECREATIONAL INTERPRETATIONS--Continued  
Douglas County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
		Restricted permeability	0.94	Restricted permeability	0.94	Restricted permeability Slope	0.94 0.87
QUA: Quarries-----	100	Not rated		Not rated		Not rated	
Re: Reading-----	90	Very limited Flooding	1.00	Not limited		Not limited	
Ro: River Wash-----	100	Not rated		Not rated		Not rated	
Sa: Sand Pit-----	100	Not rated		Not rated		Not rated	
Sb: Sarpy-----	55	Very limited Flooding Too sandy	1.00 0.88	Somewhat limited Too sandy	0.88	Somewhat limited Too sandy Flooding	0.88 0.60
Eudora-----	45	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
Sc: Sharpsburg-----	88	Somewhat limited Restricted permeability	0.15	Somewhat limited Restricted permeability	0.15	Somewhat limited Restricted permeability Slope	0.15 0.13
Sd: Sharpsburg-----	85	Somewhat limited Restricted permeability	0.15	Somewhat limited Restricted permeability	0.15	Very limited Slope Restricted permeability	1.00 0.15
Sh: Sibleyville-----	90	Not limited		Not limited		Somewhat limited Slope Depth to bedrock	0.87 0.71
So: Sibleyville, eroded-	85	Not limited		Not limited		Somewhat limited Slope Depth to bedrock	0.87 0.71
Ss: Sibleyville-----	60	Not limited		Not limited		Somewhat limited Slope Depth to bedrock	0.87 0.29
St: Sibleyville, eroded-	50	Not limited		Not limited		Somewhat limited Slope Depth to bedrock	0.87 0.71
SU: Summit-----	90	Somewhat limited Restricted permeability Depth to saturated zone	0.94 0.39	Somewhat limited Restricted permeability Depth to saturated zone	0.94 0.19	Somewhat limited Restricted permeability Slope Depth to saturated zone	0.94 0.87 0.39
Sv: Sibleyville-----	50	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope Depth to bedrock	1.00 0.71
SVV: Sibleyville-----	45	Not limited		Not limited		Somewhat limited Slope Depth to bedrock	0.87 0.54
Vinland-----	35	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Slope Gravel content	1.00 0.87 0.04
Sw: Sogn-----	55	Very limited Depth to bedrock Slope	1.00 0.84	Very limited Depth to bedrock Slope	1.00 0.84	Very limited Depth to bedrock Slope Content of large stones	1.00 1.00 0.00
Vinland-----	30	Very limited Depth to bedrock Slope	1.00 0.37	Very limited Depth to bedrock Slope	1.00 0.37	Very limited Slope Depth to bedrock Gravel content	1.00 1.00 0.04
Sx: Rock Outcrop-----	60	Not rated		Not rated		Not rated	

RECREATIONAL INTERPRETATIONS--Continued  
Douglas County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Vinland-----	26	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Slope Depth to bedrock Gravel content	1.00 1.00 0.04
Tc: Thurman-----	35	Somewhat limited Too sandy	0.50	Somewhat limited Too sandy	0.50	Very limited Slope Too sandy	1.00 0.50
VA: Verdigris-----	88	Very limited Flooding	1.00	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
Vc: Vinland-----	50	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Slope Gravel content	1.00 0.87 0.04
Vh: Vinland-----	60	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Slope Gravel content	1.00 0.87 0.04
Vm: Vinland-----	40	Very limited Depth to bedrock Slope	1.00 0.37	Very limited Depth to bedrock Slope	1.00 0.37	Very limited Slope Depth to bedrock Gravel content	1.00 1.00 0.04
Martin-----	25	Somewhat limited Restricted permeability Depth to saturated zone Slope	0.94 0.39 0.04	Somewhat limited Restricted permeability Depth to saturated zone Slope	0.94 0.19 0.04	Very limited Slope Restricted permeability Depth to saturated zone	1.00 0.94 0.39
W: Water (< 40 Acres)--	100	Very limited Slope Restricted permeability	1.00 1.00	Very limited Slope Restricted permeability	1.00 1.00	Very limited Slope Restricted permeability	1.00 1.00
Wc: Wabash-----	88	Very limited Depth to saturated zone Flooding Restricted permeability	1.00 1.00 1.00	Very limited Depth to saturated zone Restricted permeability	1.00 1.00	Very limited Depth to saturated zone Restricted permeability Flooding	1.00 1.00 0.60
Wh: Wabash-----	90	Very limited Depth to saturated zone Flooding Restricted permeability Too clayey	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Restricted permeability Too clayey	1.00 1.00 1.00	Very limited Depth to saturated zone Restricted permeability Too clayey Flooding	1.00 1.00 1.00 0.60
Wo: Woodson-----	90	Very limited Depth to saturated zone Restricted permeability	1.00 1.00	Very limited Depth to saturated zone Restricted permeability	1.00 1.00	Very limited Depth to saturated zone Restricted permeability	1.00 1.00
Ws: Woodson-----	90	Very limited Depth to saturated zone Restricted permeability	1.00 1.00	Very limited Depth to saturated zone Restricted permeability	1.00 1.00	Very limited Depth to saturated zone Restricted permeability Slope	1.00 1.00 0.00
Wx: Woodson, eroded----	90	Very limited Depth to saturated zone Restricted permeability	1.00 1.00	Very limited Depth to saturated zone Restricted permeability	1.00 1.00	Very limited Depth to saturated zone Restricted permeability Slope	1.00 1.00 0.00

RECREATIONAL INTERPRETATIONS--Continued  
Douglas County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Paths and trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value
059BC: Bates-----	90	Not limited		Somewhat limited Depth to bedrock	0.42
059BD: Bates-----	60	Not limited		Somewhat limited Depth to bedrock	0.01
Collinsville-----	25	Not limited		Very limited Depth to bedrock	1.00
				Droughty	0.73
				Content of large stones	0.03
059BH: Bates-----	50	Not limited		Somewhat limited Depth to bedrock	0.16
				Slope	0.00
Collinsville-----	35	Not limited		Very limited Depth to bedrock	1.00
				Droughty	0.73
				Slope	0.16
				Content of large stones	0.03
059BS: Bolivar-----	50	Not limited		Somewhat limited Depth to bedrock	0.16
				Slope	0.04
Hector-----	40	Not limited		Very limited Depth to bedrock	1.00
				Droughty	0.98
				Slope	0.04
059CM: Clareson-----	55	Not limited		Somewhat limited Depth to bedrock	0.80
				Droughty	0.31
				Content of large stones	0.20
				Slope	0.04
Eram-----	30	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
				Depth to bedrock	0.01
				Slope	0.00
059DN: Dennis-----	60	Somewhat limited Depth to saturated zone	0.86	Somewhat limited Depth to saturated zone	0.94
Bates-----	30	Not limited		Somewhat limited Depth to bedrock	0.16
059EA: Eram-----	55	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
				Slope	0.16
				Depth to bedrock	0.01
Lebo-----	35	Not limited		Somewhat limited Depth to bedrock	0.65
				Slope	0.16
059EC: Eram-----	60	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
				Depth to bedrock	0.01
Lula-----	25	Not limited		Not limited	
059LN: Lebo-----	75	Very limited Slope Content of large stones	1.00 0.14	Very limited Slope Content of large stones	1.00 1.00
				Depth to bedrock	0.65
				Droughty	0.18
Rock Outcrop-----	15	Not rated		Not rated	
059MB: Mason-----	90	Not limited		Not limited	
059OS: Osage-----	85	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
				Flooding	0.60
059VB: Verdigris-----	85	Not limited		Somewhat limited	

RECREATIONAL INTERPRETATIONS--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Paths and trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value
087EC: Eudora-----	65	Not limited		Flooding	0.60
Bismarckgrove-----	20	Not limited		Somewhat limited Flooding	0.60
087FU: Fluvaquents-----	100	Somewhat limited Flooding	0.40	Somewhat limited Flooding	0.60
				Very limited Flooding	1.00
				Depth to saturated zone	0.02
087MU: Muscotah-----	85	Not limited		Somewhat limited Depth to saturated zone	0.03
091EB: Eudora-----	85	Not limited		Not limited	
091MC: Morrill-----	85	Not limited		Not limited	
139CM: Clareson-----	55	Not limited		Somewhat limited Depth to bedrock	0.90
				Droughty	0.29
				Content of large stones	0.20
				Slope	0.04
Eram-----	30	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
				Depth to bedrock	0.65
				Slope	0.00
139ED: Elmont-----	85	Not limited		Not limited	
139LU: Lula-----	85	Not limited		Not limited	
177MF: Martin-----	90	Not limited		Somewhat limited Depth to saturated zone	0.22
				Slope	0.04
177SW: Stony Steep Land----	60	Not rated		Not rated	
Vinland-----	26	Very limited Slope	1.00	Very limited Depth to bedrock	1.00
				Slope	1.00
				Droughty	0.05
601KW: Konawa-----	90	Not limited		Somewhat limited Slope	0.96
601SA: Sarpy-----	55	Somewhat limited Too sandy	0.88	Somewhat limited Droughty	0.69
				Flooding	0.60
Haynie-----	35	Not limited		Somewhat limited Flooding	0.60
2326: Kenoma-----	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
2540: Leanna-----	85	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
				Flooding	0.60
2797: Morrill, stony-----	85	Not limited		Somewhat limited Slope	0.04
3460: Sibleyville-----	50	Not limited		Somewhat limited Depth to bedrock	0.71
				Slope	0.37
Vinland-----	35	Not limited		Very limited Depth to bedrock	1.00
				Slope	0.37
				Droughty	0.16
3461: Sibleyville, eroded-	85	Not limited		Somewhat limited Depth to bedrock	0.71

RECREATIONAL INTERPRETATIONS--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Paths and trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value
3462: Sibleyville-----	85	Not limited		Somewhat limited Depth to bedrock	0.71
3464: Sibleyville-----	50	Not limited		Not limited	
Vinland-----	30	Not limited		Very limited Depth to bedrock Droughty	1.00 0.16
3494: Summit-----	85	Not limited		Not limited	
3495: Summit-----	85	Not limited		Somewhat limited Depth to saturated zone	0.19
3815: Verdigris-----	85	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
3926: Water (less Than 40-	100	Very limited Slope Water erosion	1.00 1.00	Very limited Slope	1.00
3951: Woodson-----	85	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
AED: Arents, Earthen Dam-	100	Not rated		Not rated	
Be: Basehor-----	50	Not limited		Very limited Depth to bedrock Droughty Slope Content of large stones	1.00 0.96 0.37 0.03
BOP: Borrow Pits-----	100	Not rated		Not rated	
Et: Eudora-----	90	Not limited		Not limited	
Ev: Eudora-----	60	Not limited		Not limited	
Kimo-----	30	Not limited		Somewhat limited Depth to saturated zone	0.19
Ew: Eudora-----	65	Not limited		Not limited	
Kimo-----	25	Not limited		Not limited	
Gm: Gymer-----	85	Not limited		Not limited	
Gy: Gymer-----	88	Not limited		Not limited	
Ju: Judson-----	85	Not limited		Not limited	
KA: Kennebec-----	99	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
Kb: Kennebec-----	95	Not limited		Somewhat limited Flooding	0.60
Kc: Kennebec-----	88	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
Km: Kimo-----	90	Not limited		Somewhat limited Depth to saturated zone	0.19
Le: Leanna, drained----	85	Somewhat limited Depth to saturated zone	0.86	Somewhat limited Depth to saturated zone Flooding	0.94 0.60
M-W: Miscellaneous Water-	100	Not rated		Not rated	
Mb: Martin-----	90	Not limited		Somewhat limited	

RECREATIONAL INTERPRETATIONS--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Paths and trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Mc: Martin-----	85	Not limited		Depth to saturated zone	0.19
Mh: Martin, eroded-----	85	Not limited		Somewhat limited Depth to saturated zone	0.19
Mo: Martin-----	40	Not limited		Not limited	
Oska-----	30	Not limited		Somewhat limited Depth to saturated zone	0.19
Mr: Morrill-----	90	Not limited		Somewhat limited Depth to bedrock	0.01
Ms: Morrill-----	85	Not limited		Not limited	
Oe: Oska-----	88	Not limited		Somewhat limited Slope	0.16
Pb: Pawnee-----	90	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to bedrock	0.01
Pc: Pawnee-----	85	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Ph: Pawnee, eroded-----	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
QUA: Quarries-----	100	Not rated		Not rated	
Re: Reading-----	90	Not limited		Not limited	
Ro: River Wash-----	100	Not rated		Not rated	
Sa: Sand Pit-----	100	Not rated		Not rated	
Sb: Sarpy-----	55	Somewhat limited Too sandy	0.88	Somewhat limited Droughty Flooding	0.69
Eudora-----	45	Not limited		Somewhat limited Flooding	0.60
Sc: Sharpsburg-----	88	Not limited		Not limited	
Sd: Sharpsburg-----	85	Not limited		Not limited	
Sh: Sibleyville-----	90	Not limited		Somewhat limited Depth to bedrock	0.71
So: Sibleyville, eroded-----	85	Not limited		Somewhat limited Depth to bedrock	0.71
Ss: Sibleyville-----	60	Not limited		Somewhat limited Depth to bedrock	0.29
St: Sibleyville, eroded-----	50	Not limited		Somewhat limited Depth to bedrock	0.71
SU: Summit-----	90	Not limited		Somewhat limited Depth to saturated zone	0.19
Sv: Sibleyville-----	50	Not limited		Somewhat limited Depth to bedrock Slope	0.71 0.37
SVV: Sibleyville-----	45	Not limited		Somewhat limited Depth to bedrock	0.54
Vinland-----	35	Not limited		Very limited Depth to bedrock	1.00



RECREATIONAL INTERPRETATIONS--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Paths and trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Sw: Sogn-----	55	Not limited		Very limited Depth to bedrock Droughty Slope Content of large stones	1.00 0.92 0.84 0.00
Vinland-----	30	Not limited		Very limited Depth to bedrock Slope Droughty	1.00 0.37 0.11
Sx: Rock Outcrop-----	60	Not rated		Not rated	
Vinland-----	26	Very limited Slope	1.00	Very limited Depth to bedrock Slope Droughty	1.00 1.00 0.11
Tc: Thurman-----	35	Somewhat limited Too sandy	0.50	Somewhat limited Droughty	0.02
VA: Verdigris-----	88	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
Vc: Vinland-----	50	Not limited		Very limited Depth to bedrock Droughty	1.00 0.09
Vh: Vinland-----	60	Not limited		Very limited Depth to bedrock Droughty	1.00 0.11
Vm: Vinland-----	40	Not limited		Very limited Depth to bedrock Slope Droughty	1.00 0.37 0.11
Martin-----	25	Not limited		Somewhat limited Depth to saturated zone Slope	0.19 0.04
W: Water (< 40 Acres)--	100	Very limited Slope Water erosion	1.00 1.00	Very limited Slope	1.00
Wc: Wabash-----	88	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Flooding	1.00 0.60
Wh: Wabash-----	90	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone Too clayey Flooding	1.00 1.00 0.60
Wo: Woodson-----	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Ws: Woodson-----	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Wx: Woodson, eroded-----	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00

WILDLIFE INTERPRETATIONS  
Douglas County, Kansas

Use and Explanation of Wildlife Interpretations

Soils directly affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the development of water impoundments. The kind and abundance of wildlife that populate an area depend largely on the amount and distribution of food, cover, water, and living space. If any one of these elements is missing, inadequate, or inaccessible, wildlife will be scarce or will not inhabit the area. If the soils have the potential, wildlife habitat can be created or improved by planting appropriate vegetation, properly managing the existing plant cover, and fostering the natural establishment of desirable plants.

In the Wildlife Interpretations table, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

Suitability Ratings

The potential of the soil is rated good, fair, poor, or very poor.

Good - means that the element of wildlife habitat or the kind of habitat is easily created, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected if the soil is used for the designated purpose.

Fair - means that the element of wildlife habitat or kind of habitat can be created, improved, or maintained in most places. Moderately intensive management is required for satisfactory results.

Poor - means that limitations are severe for the designated element or kind of wildlife habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and requires intensive effort.

Very Poor - means that limitations are very severe for the designated element or kind of wildlife habitat. Habitat is difficult to create, improve, or maintain in most places, and management is difficult and requires intensive effort.

Description of Wildlife Habitat Elements

Openland habitat consists of croplands, pastures, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The kind of wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, killdeer, cottontail rabbit, red fox, and coyote.

Woodland habitat consists of hardwood or conifers, or a mixture of these and associated grasses, legumes and wild herbaceous plants. Examples of wildlife attracted to this habitat are wild turkey, thrushes, woodpeckers, owl, tree squirrels, raccoon, and deer.

Wetland habitat consists of water-tolerant plants in open, marshy or swampy, shallow water areas. Examples of wildlife attracted to this habitat are ducks, geese, herons, bitterns, rails, kingfishers, shorebirds, muskrat, mink, and beaver.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture also are considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, and grama.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated good are Russian-olive, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Shrubs are bushy woody plants that produce fruit, buds, twigs, bark, and foliage. Soil properties and features that affect the growth of shrubs are depth of the root zone, available water capacity, salinity, and soil moisture. Examples of shrubs are fragrant sumac, chokecherry, American plum, sand plum, and gorden currant.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, saltgrass, cordgrass, rushes, sedges, and cattails.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, cottontail, red fox and coyote.

Habitat for woodland wildlife consists of areas of deciduous and/or coniferous plants and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, thrushes, woodpeckers, squirrels, gray fox, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Habitat for rangeland wildlife consists of areas of shrubs and wild herbaceous plants. Wildlife attracted to rangeland include antelope, deer, cottontail rabbit, prairie chicken, meadowlark, quail, and pheasant.

WILDLIFE INTERPRETATIONS  
Douglas County, Kansas

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
059BC: BATES-----	Good	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor	Good
059BD: BATES-----	Good	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor	Good
COLLINSVILLE----	Very poor	Poor	Poor	Very poor	Very poor	---	Very poor	Very poor	Poor	Very poor	Very poor	---
059BH: BATES-----	Good	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor	Good
COLLINSVILLE----	Very poor	Poor	Poor	Very poor	Very poor	---	Very poor	Very poor	Poor	Very poor	Very poor	---
059BS: BOLIVAR-----	Fair	Good	Good	Good	Good	---	Very poor	Very poor	Good	Good	Very poor	---
HECTOR-----	Very poor	Poor	Poor	Poor	Very poor	---	Very poor	Very poor	Poor	Poor	Very poor	---
059CM: CLARESON-----	Fair	Good	Good	Fair	Fair	Fair	Very poor	Very poor	Good	Fair	Very poor	Fair
ERAM-----	Fair	Good	Good	Good	Good	---	Very poor	Very poor	Good	Good	Very poor	---
059DN: DENNIS-----	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
BATES-----	Good	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor	Good
059EA: ERAM-----	Fair	Good	Good	Good	Good	---	Very poor	Very poor	Good	Good	Very poor	---
LEBO-----	Poor	Poor	Good	Good	Good	---	Very poor	Very poor	Fair	Good	Very poor	---
059EC: ERAM-----	Fair	Good	Good	Good	Good	---	Very poor	Very poor	Good	Good	Very poor	---
LULA-----	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
059LN: LEBO-----	Very poor	Very poor	Good	Good	Good	---	Very poor	Very poor	Fair	Good	Very poor	---
ROCK OUTCROP----	---	---	---	---	---	---	---	---	---	---	---	---
059MB: MASON-----	Good	Good	Good	Good	Good	---	Poor	Very poor	Good	Good	Very poor	---
059OS: OSAGE-----	Fair	Fair	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good	---
059VB: VERDIGRIS-----	Good	Good	Good	Good	Good	Good	Poor	Fair	Good	Good	Poor	Good
087EC: EUDORA-----	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor	Good
BISMARCKGROVE----	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Poor	---
087FU: Fluvaquents-----	Poor	Fair	Fair	Good	Good	---	Good	Good	Fair	Good	Fair	---
087MU: MUSCOTAH-----	Fair	Good	Good	Poor	Good	Good	Fair	Fair	Good	Good	Fair	---
091EB: EUDORA-----	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor	---

WILDLIFE INTERPRETATIONS--Continued  
Douglas County, Kansas

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
091MC: MORRILL-----	Fair	Good	Good	Fair	Fair	Good	Very poor	Very poor	Good	Fair	Very poor	Good
139CM: CLARESON-----	Fair	Good	Good	Fair	Fair	Fair	Very poor	Very poor	Good	Fair	Very poor	Fair
ERAM-----	Fair	Good	Good	Good	Good	---	Very poor	Very poor	Good	Good	Very poor	---
139ED: ELMONT-----	Fair	Good	Good	Fair	Fair	Good	Poor	Very poor	Good	Fair	Very poor	Good
139LU: LULA-----	Good	Good	Good	Good	Good	Fair	Poor	Very poor	Good	Good	Very poor	Good
177MF: MARTIN-----	Fair	Good	Good	Fair	Fair	Good	Poor	Very poor	Good	Fair	Very poor	Good
177SW: STONY STEEP LAND	---	---	---	---	---	---	---	---	---	---	---	---
VINLAND-----	Poor	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor	Fair
601KW: KONAWA-----	Fair	Good	Good	Good	Good	---	Very poor	Very poor	Good	Good	Very poor	---
601SA: SARPY-----	Poor	Poor	Fair	Poor	Poor	---	Very poor	Very poor	Poor	Poor	Very poor	---
HAYNIE-----	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
2326: KENOMA-----	Good	Good	Fair	Fair	Fair	Fair	Poor	Fair	Good	Fair	Poor	Fair
2540: LEANNA-----	Poor	Fair	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair	---
2797: MORRILL-----	Poor	Fair	Good	Good	Good	Good	Poor	Very poor	Fair	Good	Very poor	Good
3460: SIBLEYVILLE-----	Fair	Good	Good	Fair	Fair	Good	Poor	Very poor	Good	Fair	Very poor	Good
VINLAND-----	Poor	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor	Fair
3461: SIBLEYVILLE-----	Fair	Good	Good	Fair	Fair	Good	Poor	Very poor	Good	Fair	Very poor	Good
3462: SIBLEYVILLE-----	Fair	Good	Good	Fair	Fair	Good	Poor	Very poor	Good	Fair	Very poor	Good
3464: SIBLEYVILLE-----	Fair	Good	Good	Fair	Fair	Good	Poor	Very poor	Good	Fair	Very poor	Good
VINLAND-----	Poor	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor	Fair
3494: SUMMIT-----	Good	Good	Fair	Good	Good	Poor	Poor	Poor	Good	Good	Poor	Good
3495: SUMMIT-----	Good	Good	Fair	Good	Good	---	Poor	Poor	Good	Good	Poor	---
3815: VERDIGRIS-----	Good	Good	Good	Good	Good	Good	Poor	Fair	Good	Good	Poor	Good
3926: WATER (LESS THAN 40-----	---	---	---	---	---	---	---	---	---	---	---	---

WILDLIFE INTERPRETATIONS--Continued  
Douglas County, Kansas

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
3951: WOODSON-----	Fair	Good	Fair	Poor	Poor	Fair	Poor	Good	Fair	Fair	Fair	Fair
AED: ARENTS, EARTHEN DAM-----	---	---	---	---	---	---	---	---	---	---	---	---
Be: BASEHOR-----	Poor	Poor	Fair	Good	Good	Fair	Very poor	Very poor	Poor	Good	Very poor	Poor
BOP: BORROW PITS-----	---	---	---	---	---	---	---	---	---	---	---	---
Et: EUDORA-----	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor	---
Ev: EUDORA-----	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor	---
KIMO-----	Good	Good	Good	Fair	Fair	Fair	Good	Good	Good	Fair	Good	---
Ew: EUDORA-----	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor	---
KIMO-----	---	---	---	---	---	---	---	---	---	---	---	---
Gm: GYMER-----	Good	Good	Fair	Good	Good	Good	Poor	Very poor	Good	---	Very poor	Fair
Gy: GYMER-----	Fair	Good	Fair	Good	Good	Good	Poor	Very poor	Fair	---	Very poor	Fair
Ju: JUDSON-----	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
KA: KENNEBEC-----	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
Kb: KENNEBEC-----	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
Kc: KENNEBEC-----	Poor	Poor	Good	Good	Good	---	Poor	Poor	Poor	Good	Poor	---
Km: KIMO-----	Good	Good	Good	Fair	Fair	Fair	Good	Good	Good	Fair	Good	---
Le: LEANNA-----	Fair	Good	Fair	Good	Good	Good	Fair	Good	Fair	Good	Fair	---
M-W: MISCELLANEOUS WATER-----	---	---	---	---	---	---	---	---	---	---	---	---
Mb: MARTIN-----	Good	Good	Good	Fair	Fair	Good	Poor	Poor	Good	Fair	Poor	Good
Mc: MARTIN-----	Fair	Good	Good	Fair	Fair	Good	Poor	Very poor	Good	Fair	Very poor	Good
Mh: MARTIN-----	Fair	Good	Good	Fair	Fair	Good	Poor	Very poor	Good	Fair	Very poor	Good
Mo: MARTIN-----	Good	Good	Good	Fair	Fair	Good	Poor	Poor	Good	Fair	Poor	Good
OSKA-----	Fair	Good	Good	---	---	Good	Poor	Poor	Fair	---	Poor	Good
Mr: MORRILL-----	Fair	Good	Good	Fair	Fair	Good	Very poor	Very poor	Good	Fair	Very poor	Good
Ms: MORRILL-----	Fair	Good	Good	Fair	Fair	Good	Very poor	Very poor	Good	Fair	Very poor	Good
Oe: OSKA-----	Fair	Good	Good	---	---	Good	Poor	Poor	Fair	---	Poor	Good

WILDLIFE INTERPRETATIONS--Continued  
Douglas County, Kansas

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
Pb: PAWNEE-----	Fair	Good	Good	---	Fair	Fair	Very poor	Poor	Good	---	Poor	Fair
Pc: PAWNEE-----	Fair	Good	Good	---	Fair	Fair	Very poor	Poor	Good	---	Poor	Fair
Ph: PAWNEE-----	Fair	Good	Good	---	Fair	Fair	Very poor	Poor	Good	---	Poor	Fair
QUA: QUARRIES-----	---	---	---	---	---	---	---	---	---	---	---	---
Re: READING-----	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor	---
Ro: RIVER WASH-----	---	---	---	---	---	---	---	---	---	---	---	---
Sa: SAND PIT-----	---	---	---	---	---	---	---	---	---	---	---	---
Sb: SARPY-----	Poor	Poor	Fair	Poor	Poor	---	Very poor	Very poor	Poor	Poor	Very poor	---
EUDORA-----	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor	Good
Sc: SHARPSBURG-----	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
Sd: SHARPSBURG-----	Fair	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
Sh: SIBLEYVILLE-----	Fair	Good	Good	Fair	Fair	Good	Poor	Very poor	Good	Fair	Very poor	Good
So: SIBLEYVILLE-----	Fair	Good	Good	Fair	Fair	Good	Poor	Very poor	Good	Fair	Very poor	Good
Ss: SIBLEYVILLE-----	Fair	Good	Good	Fair	Fair	Good	Poor	Very poor	Good	Fair	Very poor	Good
St: SIBLEYVILLE-----	Fair	Good	Good	Fair	Fair	Good	Poor	Very poor	Good	Fair	Very poor	Good
SU: SUMMIT-----	Fair	Good	Fair	Good	Good	Poor	Poor	Very poor	Fair	Good	Very poor	Good
Sv: SIBLEYVILLE-----	Fair	Good	Good	Fair	Fair	Good	Very poor	Very poor	Good	Fair	Very poor	Good
SVV: SIBLEYVILLE-----	Fair	Good	Good	Fair	Fair	Good	Poor	Very poor	Good	Fair	Very poor	Good
VINLAND-----	Poor	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor	Fair
Sw: SOGN-----	Very poor	Very poor	Poor	---	---	Poor	Very poor	Very poor	Very poor	---	Very poor	Poor
VINLAND-----	Poor	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor	Fair
Sx: ROCK OUTCROP----	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
VINLAND-----	Poor	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor	Fair
Tc: THURMAN-----	Poor	Fair	Good	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair

WILDLIFE INTERPRETATIONS--Continued  
Douglas County, Kansas

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
VA: VERDIGRIS-----	Poor	Fair	Fair	Good	Good	Good	Poor	Fair	Fair	Good	Poor	Good
Vc: VINLAND-----	Poor	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor	Fair
Vh: VINLAND-----	Poor	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor	Fair
Vm: VINLAND-----	Poor	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor	Fair
MARTIN-----	Fair	Good	Good	Fair	Fair	Good	Poor	Very poor	Good	Fair	Very poor	Good
W: WATER (< 40 ACRES)-----	---	---	---	---	---	---	---	---	---	---	---	---
Wc: WABASH-----	Poor	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good	---
Wh: WABASH-----	Poor	Poor	Poor	Poor	Poor	---	Poor	Good	Poor	Poor	Fair	---
Wo: WOODSON-----	Good	Good	Fair	Poor	Poor	Fair	Poor	Good	Fair	Fair	Fair	Fair
Ws: WOODSON-----	Fair	Good	Fair	Poor	Poor	Fair	Poor	Good	Fair	Fair	Fair	Fair
Wx: WOODSON-----	Fair	Good	Fair	Poor	Poor	Fair	Poor	Good	Fair	Fair	Fair	Fair



YIELDS PER ACRE OF PASTURE AND HAYLAND  
Douglas County, Kansas

## Use and Explanation of Pastureland and Hayland Interpretations

This subsection provides information concerning the suitability of soils for the production of pasture and hayland. This subsection may contain pasture and hayland suitability groupings, land capability and yield estimates, yield estimates for individual grasses or legumes, or other information pertaining to the production of forage.

## Pasture and Hayland Suitability Groupings

Soils are placed in pasture and hayland groups according to their suitability for the production of forage. The soils in each group are enough alike to be suited to the same grasses or legumes, to have similar limitations and hazards, to require similar management, and to have similar productivity and other responses to management. Thus, the pasture and hayland suitability group is a convenient way of grouping the soils for their management. If used, these groupings are identified and described in other reports in the subsection.

## Yield Estimates

The average yields per acre that can be expected of the principal pasture or hayland crops, under a high level of management, are presented in this subsection. In any given year, yields may be higher or lower than those indicated in the tables because of variations in rainfall or other climatic factors. The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

Under good management, proper grazing is essential for the production of high quality forage, stand survival, and erosion control. Proper grazing helps plants maintain sufficient and generally vigorous top growth during the growing season. Brush control is essential in many areas, and weed control generally is needed. Rotation grazing and renovation are also important management practices.

The Pasture and Hayland table show yield estimates in tons per acre and animal unit months for pasture and hayland groups. An animal unit month is the amount of forage required by one animal unit (AU) for 30 days. On animal unit (AU) is one (1000 pound) mature cow and a calf up to weaning age (usually six months of age) or their equivalent. The Natural Resources Conservation Service uses 900 pounds of air dry forage as the amount needed to meet this requirement. To maintain a healthy and vigorous plant community, the degree of use should never be greater than 50 percent. Therefore only 25 percent of the total biomass grown is considered consumed by the grazing animal. Animal Unit Months can be converted to air dry pounds per acre production by multiplying the AUM by 30 days, then by 30 pounds per day, and then by four. This figure is the amount of total forage production.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil in the Nontechnical Description section. Specific information on plants and yields can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

YIELDS PER ACRE OF PASTURE AND HAYLAND--Continued  
Douglas County, Kansas

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(Yields in the "N" columns are for nonirrigated soils; those in the "I" columns are for irrigated soils. Yields are those that can be expected under a high level of nonirrigated and irrigated management by component. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)  
Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

Map symbol and soil name	Land capability		Alfalfa hay	
	N	I	N	I
			Tons	Tons
059BC: Bates-----	2e	---	3.50	---
059BD: Bates-----	4e	---	3.00	---
Collinsville-----	e	---	---	---
059BH: Bates-----	6s	---	3.00	---
Collinsville-----	7s	---	---	---
059BS: Bolivar-----	6e	---	---	---
Hector-----	7e	---	---	---
059CM: Clareson-----	6e	---	---	---
Eram-----	6e	---	---	---
059DN: Dennis-----	3e	---	4.00	---
Bates-----	3e	---	3.00	---
059EA: Eram-----	6e	---	---	---
Lebo-----	6e	---	---	---
059EC: Eram-----	4e	---	---	---
Lula-----	3e	---	---	---
059LN: Lebo-----	7e	---	---	---
Rock Outcrop-----	8e	---	---	---
059MB: Mason-----	1	---	4.50	---
059OS: Osage-----	2w	---	---	---
059VB: Verdigris-----	2w	---	5.00	---
087EC: Eudora-----	2w	---	5.00	---
Bismarckgrove-----	2w	---	4.00	---
087FU: Fluvaquents-----	5w	---	---	---
087MU: Muscotah-----	2w	2w	---	---
091EB: Eudora-----	1	---	5.00	---
091MC: Morrill-----	3e	---	3.60	---
139CM: Clareson-----	6e	---	---	---
Eram-----	6e	---	---	---
139ED: Elmont-----	3e	---	3.60	---
139LU: Lula-----	2e	---	4.90	---

(Yields in the "N" columns are for nonirrigated soils; those in the "I" columns are for irrigated soils. Yields are those that can be expected under a high level of nonirrigated and irrigated management by component. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)  
Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

Map symbol and soil name	Land capability		Alfalfa hay	
	N	I	N	I
			Tons	Tons
177MF: Martin-----	4e	---	2.80	---
177SW: Stony Steep Land-----	8	---	---	---
Vinland-----	6e	---	---	---
601KW: Konawa-----	6e	---	---	---
601SA: Sarpy-----	3w	---	---	---
Haynie-----	2w	---	---	---
2326: Kenoma-----	3e	---	3.20	---
2540: Leanna-----	2w	---	3.20	---
2797: Morrill, stony-----	6e	---	---	---
3460: Sibleyville-----	6e	---	3.20	---
Vinland-----	6e	---	---	---
3461: Sibleyville, eroded-----	4e	---	3.00	---
3462: Sibleyville-----	3e	---	3.20	---
3464: Sibleyville-----	4e	---	3.20	---
Vinland-----	6e	---	---	---
3494: Summit-----	2e	---	4.00	---
3495: Summit-----	3e	---	4.00	---
3815: Verdigris-----	5w	---	5.00	---
3926: Water (less Than 40-----	---	---	---	---
3951: Woodson-----	3e	---	3.30	---
AED: Arents, Earthen Dam-----	8	---	---	---
Be: Basehor-----	6s	---	---	---
BOP: Borrow Pits-----	---	---	---	---
Et: Eudora-----	1	---	5.00	---
Ev: Eudora-----	2w	---	5.00	---
Kimo-----	2w	---	4.50	---
Ew: Eudora-----	1	---	5.00	---
Kimo-----	2w	---	4.80	---
Gm: Gymer-----	2e	---	3.80	---

YIELDS PER ACRE OF PASTURE AND HAYLAND--Continued  
Douglas County, Kansas

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(Yields in the "N" columns are for nonirrigated soils; those in the "I" columns are for irrigated soils. Yields are those that can be expected under a high level of nonirrigated and irrigated management by component. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)  
Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

Map symbol and soil name	Land capability		Alfalfa hay	
	N	I	N	I
			Tons	Tons
Gy: Gymer-----	3e	---	3.60	---
Ju: Judson-----	1	---	---	---
KA: Kennebec-----	5w	---	---	---
Kb: Kennebec-----	2w	---	---	---
Kc: Kennebec-----	5w	---	---	---
Km: Kimo-----	2w	---	4.50	---
Le: Leanna-----	2w	---	3.20	---
M-W: Miscellaneous Water-----	---	---	---	---
Mb: Martin-----	2e	---	3.50	---
Mc: Martin-----	3e	---	3.20	---
Mh: Martin, eroded-----	4e	---	2.60	---
Mo: Martin-----	3e	---	3.20	---
Oska-----	3e	---	3.00	---
Mr: Morrill-----	3e	---	3.60	---
Ms: Morrill-----	4e	---	3.40	---
Oe: Oska-----	3e	---	3.00	---
Pb: Pawnee-----	2e	---	3.50	4.80
Pc: Pawnee-----	3e	---	3.50	4.80
Ph: Pawnee, eroded-----	3e	---	3.00	4.40
QUA: Quarries-----	---	---	---	---
Re: Reading-----	1	---	5.60	---
Ro: River Wash-----	8s	---	---	---
Sa: Sand Pit-----	---	---	---	---
Sb: Sarpy-----	3w	---	4.50	---
Eudora-----	3w	---	5.00	---
Sc: Sharpsburg-----	2e	---	---	---
Sd: Sharpsburg-----	3e	---	---	---

YIELDS PER ACRE OF PASTURE AND HAYLAND--Continued  
Douglas County, Kansas

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(Yields in the "N" columns are for nonirrigated soils; those in the "I" columns are for irrigated soils. Yields are those that can be expected under a high level of nonirrigated and irrigated management by component. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)  
Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

Map symbol and soil name	Land capability		Alfalfa hay	
	N	I	N	I
			Tons	Tons
Sh: Sibleyville-----	3e	---	3.20	---
So: Sibleyville, eroded-----	4e	---	3.00	---
Ss: Sibleyville-----	4e	---	3.20	---
St: Sibleyville, eroded-----	4e	---	3.00	---
SU: Summit-----	3e	---	4.90	---
Sv: Sibleyville-----	6e	---	---	---
SVV: Sibleyville-----	4e	---	3.20	---
Vinland-----	e	---	---	---
Sw: Sogn-----	7s	---	---	---
Vinland-----	6e	---	---	---
Sx: Rock Outcrop-----	8	---	---	---
Vinland-----	6e	---	---	---
Tc: Thurman-----	4e	---	1.10	3.20
VA: Verdigris-----	5w	---	5.60	---
Vc: Vinland-----	6e	---	---	---
Vh: Vinland-----	6e	---	---	---
Vm: Vinland-----	6e	---	---	---
Martin-----	4e	---	2.80	---
W: Water (< 40 Acres)-----	---	---	---	---
Wc: Wabash-----	3w	---	---	---
Wh: Wabash-----	3w	---	---	---
Wo: Woodson-----	2s	---	3.30	---
Ws: Woodson-----	3e	---	3.30	---
Wx: Woodson, eroded-----	4e	---	2.20	---

CONSERVATION TREE AND SHRUB MANAGEMENT  
Douglas County, Kansas

A Conservation Tree/Shrub Suitability Group (CTSG), formerly Windbreak Suitability Group, is a physiographic unit or area having similar climatic and edaphic characteristics that control the selection and height growth of trees and shrubs.

In this table, the Conservation Tree and Shrub Grouping is expressed as a group index number. The group index for Conservation Tree and Shrub groups (CTSG) are a guide for species best suited for different kinds of soil and for prediction height, growth, and effectiveness. The groupings can be used when selection woody plants for windbreaks, wildlife plantings riparian buffers, reforestation, other environmental plantings, recreation, landscaping, wetland restoration or enhancement and critical area plantings. CTSG's are developed to assure satisfactory species selection and adaptation to specific conditions of soil, climate and physiography. CTSG's are a guide for selection species best suited for different kinds of soil and prediction height growth and effectiveness.

All soil series mapped in the state have been placed in 10 groups of similar soil characteristics. Groups 1, 2, 3, 4, 6, and 9 are further divided into subgroups. In addition, all groups provide information by Major Land Resource Areas.

Each tree or shrub species has certain climatic and physiographic limits. Within these parameters a tree or shrub may be well or poorly suited because of soil characteristics. Each tree or shrub also has definable potentials of height growth depending on the factors just mentioned. Accurate definitions of potential heights are necessary for proper windbreak planning and design.

Windbreaks protect livestock, buildings, roads and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low-growing and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, help to keep snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Windbreaks are often planted on land that did not grow trees originally. Knowledge of how trees perform on such land can be gained only by observing and recording their performance where trees have been planted and survived. The problem is compounded by the fact that many favorite windbreak species are not indigenous to the areas in which they are planted.

The Kansas Field Office Technical Guide Notice KS-230, Conservation Tree and Shrub Plantings Suitability Groups shows the adapted species listing for each group index number. Showing the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates are based on measurements and observation of established plantings that have been given adequate care. This information should be used to determine the placement of a windbreak, the area protected and the arrangement of species.

A number of attributes are included in the CTSG species tables for each group number found in this section of the Field Office Technical Guide. These attributes were rated subjectively and assigned a relative value to further assist those unfamiliar with individual species characteristics or desirability for the intended use. Definitions and explanations can be found. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from the local office of the Natural Resources Conservation Service or of the Cooperative Extension Service or from a commercial nursery. See part 537 of the National Forestry Manual for additional information.

In the Tree and Shrub Management table interpretive ratings are given for various aspects of forest and conservation tree and shrub management. Some rating class terms indicate the degree to which the soils are suited to a specified forest management practice. Well suited indicates that the soil has features that are favorable for the specified practice and has no limitations. Good performance can be expected, and little or no maintenance is needed. Moderately well suited indicates that the soil has features that are moderately favorable for the specified practice. One or more soil properties are less than desirable and fair performance can be expected. Some maintenance is needed. Poorly suited indicates that the soil has one or more properties that are unfavorable for the specified practice. Overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration. Unsited indicates that the expected performance of the soil is unacceptable for the specified practice or that extreme measures are needed to overcome the undesirable soil properties.

The paragraphs that follow indicate the soil properties considered in rating the soils for forest and conservation tree and shrub management practices. More detailed information about the criteria used in the ratings is available in the "National Forestry Manual," which is available in local offices of the Natural Resources Conservation Service or on the Internet. Also, in the Kansas Field Office Technical Guide Notice KS-230, Conservation Tree and Shrub Plantings Suitability Groups.

Ratings in the columns suitability for hand planting and suitability for mechanical planting are based on slope, depth to a restrictive layer, content of sand, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, moderately well suited, poorly suited, or unsited to these methods of planting. It is assumed that necessary site preparation is completed before seedlings are planted.

Ratings in the column suitability for mechanical site preparation (surface) are based on slope, depth to a restrictive layer, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsited to this management activity. The part of the soil from the surface to a depth of about 1-foot is considered in the ratings.

Ratings in the column suitability for mechanical site preparation (deep) are based on slope, depth to a restrictive layer, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsited to this management activity. The part of the soil from the surface to a depth of about 3 feet is considered in the ratings.

Ratings in the column potential for seedling mortality are based on flooding, ponding, depth to a water table, content of lime, reaction, salinity, available water capacity, soil moisture regime, soil temperature regime, aspect, and slope. The soils are described as having a low, moderate, or high potential for seedling mortality. See the National Forestry Manual, Subpart B for criteria used in rating management concerns. Specific information on plants and yields can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

CONSERVATION TREE AND SHRUB MANAGEMENT  
Douglas County,  
Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. Pines and spruces are prone to disease problems. See text for further explanation of ratings in this table.)

Map symbol and soil name	Wind break Group	Suitability for hand planting	Suitability for mechanical planting	Suitability for mechanical site preparation (surface)	Suitability for mechanical site preparation (deep)	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features
059BC: Bates-----	6D	Well suited	Well suited	Well suited	Well suited	Low
059BD: Bates-----	6D	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Collinsville-----	10	Well suited	Moderately suited Rock fragments Slope	Well suited	Well suited	Low
059BH: Bates-----	6D	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Collinsville-----	10	Well suited	Moderately suited Rock fragments Slope	Well suited	Well suited	Low
059BS: Bolivar-----	6D	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Hector-----	10	Well suited	Moderately suited Slope Rock fragments	Well suited	Well suited	Low
059CM: Clareson-----	6D	Moderately suited Rock fragments	Poorly suited  Rock fragments Slope	Poorly suited  Rock fragments	Poorly suited  Rock fragments Restrictive layer	Low
Eram-----	4C	Moderately suited Stickiness	Moderately suited Stickiness Slope	Well suited	Well suited	High Wetness
059DN: Dennis-----	4C	Well suited	Well suited	Well suited	Well suited	High Wetness Low
Bates-----	6D	Well suited	Well suited	Well suited	Well suited	High
059EA: Eram-----	4C	Moderately suited Stickiness	Moderately suited Stickiness Slope	Well suited	Well suited	High Wetness
Lebo-----	6D	Moderately suited Stickiness	Moderately suited Slope Stickiness	Well suited	Well suited	Low
059EC: Eram-----	4C	Moderately suited Stickiness	Moderately suited Stickiness Slope	Well suited	Well suited	High Wetness
Lula-----	3	Moderately suited Stickiness	Moderately suited Stickiness Rock fragments	Well suited	Well suited	Low
059LN: Lebo-----	10	Moderately suited Stickiness Rock fragments	Unsuited  Slope Rock fragments Stickiness Not rated	Poorly suited  Slope Rock fragments	Poorly suited  Slope	Low
Rock Outcrop-----		Not rated		Not rated	Not rated	Not rated
059MB: Mason-----	1	Well suited	Well suited	Well suited	Well suited	Low
059OS: Osage-----	2	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	High Wetness
059VB: Verdigris-----	1	Well suited	Well suited	Well suited	Well suited	Low

CONSERVATION TREE AND SHRUB MANAGEMENT  
Douglas County,  
Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. Pines and spruces are prone to disease problems. See text for further explanation of ratings in this table.)

Map symbol and soil name	Wind break Group	Suitability for hand planting	Suitability for mechanical planting	Suitability for mechanical site preparation (surface)	Suitability for mechanical site preparation (deep)	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features
087EC: Eudora----- Bismarckgrove-----	1	Well suited Well suited	Well suited Well suited	Well suited Well suited	Well suited Well suited	Low Low
087FU: Fluvaquents-----	1	Well suited	Well suited	Well suited	Well suited	High Wetness
087MU: Muscotah-----	1	Poorly suited Stickiness	Poorly suited Stickiness	Poorly suited Stickiness	Well suited	Low
091EB: Eudora-----	1	Well suited	Well suited	Well suited	Well suited	Low
091MC: Morrill-----	3	Well suited	Moderately suited Slope	Well suited	Well suited	Low
139CM: Clareson-----	6D	Moderately suited Rock fragments	Poorly suited	Poorly suited	Poorly suited	Low
Eram-----	4C	Moderately suited Stickiness	Moderately suited Stickiness Slope	Well suited	Well suited	High Wetness
139ED: Elmont-----	3	Well suited	Moderately suited Slope	Well suited	Well suited	Low
139LU: Lula-----	3	Well suited	Well suited	Well suited	Well suited	Low
177MF: Martin-----	4C	Moderately suited Stickiness	Moderately suited Slope Stickiness	Well suited	Well suited	Low
177SW: Stony Steep Land----		Not rated	Not rated	Not rated	Not rated	Not rated
Vinland-----	10	Well suited	Poorly suited Slope	Poorly suited Slope	Poorly suited Slope	Low
601KW: Konawa-----	5	Well suited	Moderately suited Slope	Well suited	Well suited	Low
601SA: Sarpy-----	1K	Well suited	Well suited	Well suited	Well suited	Moderate Wetness
Haynie-----	1K	Well suited	Well suited	Well suited	Well suited	Moderate Lime
2326: Kenoma-----	4	Poorly suited Stickiness	Poorly suited Stickiness	Poorly suited Stickiness	Well suited	High Wetness
2540: Leanna-----	2	Well suited	Well suited	Well suited	Well suited	High Wetness
2797: Morrill, stony-----	3	Well suited	Moderately suited Slope	Well suited	Well suited	Low
3460: Sibleyville-----	6	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Vinland-----	10	Well suited	Moderately suited Slope	Well suited	Well suited	Low
3461: Sibleyville, eroded-	6	Well suited	Moderately suited Slope Rock fragments	Well suited	Well suited	Low
3462: Sibleyville-----	6	Well suited	Moderately suited Slope	Well suited	Well suited	Low



CONSERVATION TREE AND SHRUB MANAGEMENT  
Douglas County,  
Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. Pines and spruces are prone to disease problems. See text for further explanation of ratings in this table.)

Map symbol and soil name	Wind break Group	Suitability for hand planting	Suitability for mechanical planting	Suitability for mechanical site preparation (surface)	Suitability for mechanical site preparation (deep)	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features
3464: Sibleyville-----	6	Poorly suited	Moderately suited Slope	Well suited	Well suited	Low
Vinland-----	10	Restrictive layer Well suited	Moderately suited Slope	Well suited	Well suited	Low
3494: Summit-----	4C	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	Low
3495: Summit-----		Moderately suited Stickiness	Moderately suited Stickiness Slope	Well suited	Well suited	Low
3815: Verdigris-----	1	Well suited	Well suited	Well suited	Well suited	Low
3926: Water (less Than 40-		Unsuited Horizon table contains no data	Unsuited Horizon table contains no data	Unsuited Horizon table contains no data	Unsuited Horizon table contains no data	High Horizon table contains no data
3951: Woodson-----	4	Poorly suited Stickiness	Poorly suited Stickiness	Poorly suited Stickiness	Well suited	High Wetness
AED: Arents, Earthen Dam-		Not rated	Not rated	Not rated	Not rated	Not rated
Be: Basehor-----	10	Well suited	Moderately suited Slope Rock fragments	Well suited	Well suited	Low
BOP: Borrow Pits-----		Not rated	Not rated	Not rated	Not rated	Not rated
Et: Eudora-----	1	Well suited	Well suited	Well suited	Well suited	Low
Ev: Eudora-----	1	Well suited	Well suited	Well suited	Well suited	Low
Kimo-----	1	Moderately suited Stickiness	Moderately suited Stickiness	Poorly suited Stickiness	Well suited	Low
Ew: Eudora-----	1	Well suited	Well suited	Well suited	Well suited	Low
Kimo-----	1	Well suited	Well suited	Well suited	Well suited	Low
Gm: Gymer-----	4C	Well suited	Well suited	Well suited	Well suited	Low
Gy: Gymer-----	4C	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Ju: Judson-----	1	Well suited	Well suited	Well suited	Well suited	Low
KA: Kennebec-----	1	Well suited	Well suited	Well suited	Well suited	Low
Kb: Kennebec-----	1	Well suited	Well suited	Well suited	Well suited	Low
Kc: Kennebec-----	1	Well suited	Well suited	Well suited	Well suited	Low
Km: Kimo-----	1	Moderately suited Stickiness	Moderately suited Stickiness	Poorly suited Stickiness	Well suited	Low
Le: Leanna-----	2	Well suited	Well suited	Well suited	Well suited	High Wetness
M-W: Miscellaneous Water-		Not rated	Not rated	Not rated	Not rated	Not rated
Mb: Martin-----	4C	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	Low
Mc: Martin-----	4C	Moderately suited	Moderately suited	Well suited	Well suited	Low

CONSERVATION TREE AND SHRUB MANAGEMENT  
Douglas County,  
Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. Pines and spruces are prone to disease problems. See text for further explanation of ratings in this table.)

Map symbol and soil name	Wind break Group	Suitability for hand planting	Suitability for mechanical planting	Suitability for mechanical site preparation (surface)	Suitability for mechanical site preparation (deep)	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features
Mh: Martin, eroded-----	4C	Stickiness  Moderately suited Stickiness	Slope Stickiness  Moderately suited Slope Stickiness	Well suited	Well suited	Low
Mo: Martin-----	4C	Moderately suited Stickiness	Moderately suited Slope Stickiness	Well suited	Well suited	Low
Oska-----	6D	Moderately suited Stickiness	Moderately suited Stickiness Slope	Well suited	Well suited	Low
Mr: Morrill-----	3	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Ms: Morrill-----	3	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Oe: Oska-----	6D	Moderately suited Stickiness	Moderately suited Stickiness Slope	Well suited	Well suited	Low
Pb: Pawnee-----	4C	Well suited	Well suited	Well suited	Well suited	High Wetness
Pc: Pawnee-----	4C	Well suited	Moderately suited Slope	Well suited	Well suited	High Wetness
Ph: Pawnee, eroded-----	4C	Well suited	Moderately suited Slope	Well suited	Well suited	High Wetness
QUA: Quarries-----		Not rated	Not rated	Not rated	Not rated	Not rated
Re: Reading-----	1	Well suited	Well suited	Well suited	Well suited	Low
Ro: River Wash-----		Not rated	Not rated	Not rated	Not rated	Not rated
Sa: Sand Pit-----		Not rated	Not rated	Not rated	Not rated	Not rated
Sb: Sarpy-----	1K	Well suited	Well suited	Well suited	Well suited	Low
Eudora-----	1	Well suited	Well suited	Well suited	Well suited	Low
Sc: Sharpsburg-----	3	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	Low
Sd: Sharpsburg-----	3	Moderately suited Stickiness	Moderately suited Stickiness Slope	Well suited	Well suited	Low
Sh: Sibleyville-----	6D	Well suited	Moderately suited Slope	Well suited	Well suited	Low
So: Sibleyville, eroded-	6	Well suited	Moderately suited Slope Rock fragments	Well suited	Well suited	Low
Ss: Sibleyville-----	6D	Well suited	Moderately suited Slope	Well suited	Well suited	Low
St: Sibleyville, eroded-	6D	Well suited	Moderately suited	Well suited	Well suited	Low

CONSERVATION TREE AND SHRUB MANAGEMENT  
Douglas County,  
Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. Pines and spruces are prone to disease problems. See text for further explanation of ratings in this table.)

Map symbol and soil name	Wind break Group	Suitability for hand planting	Suitability for mechanical planting	Suitability for mechanical site preparation (surface)	Suitability for mechanical site preparation (deep)	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features
SU: Summit-----	4C	Moderately suited Stickiness	Slope Moderately suited Stickiness Slope	Well suited	Well suited	Low
Sv: Sibleyville-----	6D	Well suited	Moderately suited Slope	Well suited	Well suited	Low
SVV: Sibleyville-----	6D	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Vinland-----	10	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Sw: Sogn-----	10	Moderately suited Rock fragments	Poorly suited Rock fragments Slope	Poorly suited Rock fragments	Unsuited Restrictive layer	Low
Vinland-----	10	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Sx: Rock Outcrop-----		Not rated	Not rated	Not rated	Not rated	Not rated
Vinland-----	10	Well suited	Poorly suited Slope	Poorly suited Slope	Poorly suited Slope	Low
Tc: Thurman-----	7	Well suited	Moderately suited Slope	Well suited	Well suited	Low
VA: Verdigris-----	1	Well suited	Well suited	Well suited	Well suited	Low
Vc: Vinland-----	10	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Vh: Vinland-----	10	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Vm: Vinland-----	10	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Martin-----	4C	Moderately suited Stickiness	Moderately suited Slope Stickiness	Well suited	Well suited	Low
W: Water (< 40 Acres)--		Unsuited Horizon table contains no data	Unsuited Horizon table contains no data	Unsuited Horizon table contains no data	Unsuited Horizon table contains no data	High Horizon table contains no data
Wc: Wabash-----	2	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	High Wetness
Wh: Wabash-----	2	Poorly suited Stickiness	Poorly suited Stickiness	Poorly suited Stickiness	Well suited	High Wetness
Wo: Woodson-----	4C	Poorly suited Stickiness	Poorly suited Stickiness	Poorly suited Stickiness	Well suited	High Wetness
Ws: Woodson-----	4C	Poorly suited Stickiness	Poorly suited Stickiness	Poorly suited Stickiness	Well suited	High Wetness
Wx: Woodson, eroded----	4C	Poorly suited Stickiness	Poorly suited Stickiness	Poorly suited Stickiness	Well suited	High Wetness

ENGINEERING INDEX PROPERTIES  
Douglas County, Kansas

Engineering Index Properties table gives the engineering classifications and the range of index properties for the layers of each soil in the survey area. Depth to the upper and lower boundaries of each layer is indicated. Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. Loam, for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, gravelly. Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 1998) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 1998). The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection. If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in Engineering Index Properties table.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage. Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and plasticity index (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination. The estimates of particle-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is generally omitted in the table.

ENGINEERING INDEX PROPERTIES--Continued  
Douglas County, Kansas

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
059BC: Bates-----	0-19	Loam	CL, CL-ML, ML	A-4, A-6	0	0	90-100	85-100	80-100	55-90	20-40	3-15
	19-34	Loam	CL, ML, SC, SM	A-4, A-6, A-7	0	0	85-100	85-100	80-100	45-85	25-45	3-20
	34-38 38-42	Gravelly loam Unweathered bedrock	SC, SC-SM	A-2, A-4, A-6	--- ---	0-15 ---	70-90 ---	70-90 ---	50-80 ---	20-40 ---	20-35 ---	5-15 ---
059BD: Bates-----	0-19	Loam	CL, CL-ML, ML	A-4, A-6	0	0	90-100	85-100	80-100	55-90	20-40	3-15
	19-34	Loam	CL, ML, SC, SM	A-4, A-6, A-7	0	0	85-100	85-100	80-100	45-85	25-45	3-20
	34-38 38-42	Gravelly loam Unweathered bedrock	SC, SC-SM	A-2, A-4, A-6	--- ---	0-15 ---	70-90 ---	70-90 ---	50-80 ---	20-40 ---	20-35 ---	5-15 ---
Collinsville---	0-11	Loam	CL, CL-ML, ML	A-4	---	0-15	85-100	85-100	75-95	55-85	22-30	2-10
	11-17	Loam	CL, ML, SC, SM	A-2, A-4	---	0-45	55-100	55-100	50-95	20-85	15-30	NP-10
	17-21	Unweathered bedrock			---	---	---	---	---	---	---	---
059BH: Bates-----	0-19	Loam	CL, CL-ML, ML	A-4, A-6	0	0	90-100	85-100	80-100	55-90	20-40	3-15
	19-26	Loam	CL, ML, SC, SM	A-4, A-6, A-7	0	0	85-100	85-100	80-100	45-85	25-45	3-20
	26-34 34-38	Gravelly loam Unweathered bedrock	SC, SC-SM	A-2, A-4, A-6	0 ---	0-15 ---	70-90 ---	70-90 ---	50-80 ---	20-40 ---	20-35 ---	5-15 ---
Collinsville---	0-11	Loam	CL, CL-ML, ML	A-4	---	0-15	85-100	85-100	75-95	55-85	22-30	2-10
	11-17	Channery loam	CL, ML, SC, SM	A-2, A-4	---	0-45	55-100	55-100	50-95	20-85	15-30	NP-10
	17-21	Unweathered bedrock			---	---	---	---	---	---	---	---
059BS: Bolivar-----	0-13	Loam	ML	A-4	0	0	100	90-100	70-95	55-75	20-30	NP-5
	13-28	Sandy clay loam	CL, SC	A-6	0	0-10	85-100	85-100	70-95	45-80	25-40	10-25
	28-34	Channery sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	5-20	70-95	70-95	60-90	36-60	25-35	5-15
	34-38	Unweathered bedrock			---	---	---	---	---	---	---	---
Hector-----	0-9	Loam	CL-ML, ML, SC-SM, SM	A-4	0	0	80-100	75-100	70-95	40-75	15-25	NP-7
	9-18	Loam	GC-GM, GM, ML, SM	A-1-b, A-2, A-4	0-5	0-15	55-100	55-100	35-95	20-65	15-25	NP-7
	18-22	Unweathered bedrock			---	---	---	---	---	---	---	---
059CM: Clareson-----	0-7	Silty clay loam	CL	A-4, A-6	---	0-25	90-100	90-100	85-95	85-95	30-40	8-18
	7-15	Silty clay loam	CL	A-6, A-7	---	0-65	90-100	90-100	85-95	85-95	35-45	11-20
	15-26	Flaggy silty clay loam	CH, CL	A-7	---	50-85	85-100	85-100	80-95	80-95	41-60	18-35
	26-30	Unweathered bedrock			---	---	---	---	---	---	---	---
Eram-----	0-7	Silty clay loam	CL	A-6, A-7	0	0	85-100	85-100	85-100	70-95	36-48	15-25
	7-38	Silty clay	CH, CL	A-7	0	0	95-100	95-100	90-100	80-98	43-61	21-35
	38-42	Weathered bedrock			---	---	---	---	---	---	---	---
059DN: Dennis-----	0-10	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	96-100	65-97	21-36	4-15
	10-15	Silty clay loam	CL	A-6, A-7	0	0	98-100	98-100	94-100	75-98	36-43	15-21
	15-60	Silty clay	CH, CL	A-7	0	0	98-100	98-100	94-100	75-98	43-61	21-35
Bates-----	0-19	Loam	CL, CL-ML, ML	A-4, A-6	0	0	90-100	85-100	80-100	55-90	20-40	3-15
	19-26	Loam	CL, ML, SC, SM	A-4, A-6, A-7	0	0	85-100	85-100	80-100	45-85	25-45	3-20
	26-34 34-38	Gravelly loam Unweathered bedrock	SC, SC-SM	A-2, A-4, A-6	0 ---	0-15 ---	70-90 ---	70-90 ---	50-80 ---	20-40 ---	20-35 ---	5-15 ---
059EA: Eram-----	0-7	Silty clay loam	CL	A-6, A-7	0	0	85-100	85-100	85-100	70-95	36-48	15-25
	7-38	Silty clay	CH, CL	A-7	0	0	95-100	95-100	90-100	80-98	43-61	21-35
	38-42	Weathered bedrock			---	---	---	---	---	---	---	---
Lebo-----	0-14	Silty clay loam	CL	A-6, A-7-6	---	0-5	95-100	90-100	90-100	80-95	35-50	15-25
	14-28	Very channery silty clay loam	CL	A-6, A-7-6	---	0-5	75-95	55-95	55-85	50-80	35-50	15-25
	28-36	Weathered bedrock			---	---	---	---	---	---	---	---
059EC: Eram-----	0-7	Silty clay loam	CL	A-6, A-7	0	0	85-100	85-100	85-100	70-95	36-48	15-25
	7-38	Silty clay	CH, CL	A-7	0	0	95-100	95-100	90-100	80-98	43-61	21-35
	38-42	Weathered bedrock			---	---	---	---	---	---	---	---
Lula-----	0-7	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	96-100	65-97	21-37	1-15
	7-12	Silty clay loam	CL	A-4, A-6, A-7	0	0	100	100	96-100	65-98	30-43	9-20
	12-44	Silty clay loam	CL, CH	A-7	0	0-30	85-100	85-100	80-100	70-100	45-60	20-35
	44-52	Unweathered bedrock			---	---	---	---	---	---	---	---

ENGINEERING INDEX PROPERTIES--Continued  
Douglas County, Kansas

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
059LN: Lebo-----	0-7	Stony silty clay loam	CL	A-6, A-7-6	---	25-50	75-95	55-75	55-70	50-65	35-50	15-25
	7-14	Channery silty clay loam	CL	A-6, A-7-6	---	0-5	75-95	55-95	55-85	50-80	35-50	15-25
	14-28	Very channery silty clay loam	GC, GP-GC, SC, SP-SC	A-2-6, A-2-7	---	0-5	50-75	10-50	5-40	5-35	35-50	15-25
	28-36	Weathered bedrock			---	---	---	---	---	---	---	---
Rock Outcrop--- 059MB:	---	---	---	---	---	---	---	---	---	---	---	---
Mason-----	0-7	Silt loam	CL, ML	A-4, A-6	0	0	100	100	96-100	65-98	30-37	8-13
	7-60	Silty clay loam	CL	A-4, A-6, A-7	0	0	98-100	98-100	96-100	65-98	30-43	9-20
059OS: Osage-----	0-14	Silty clay loam	CL	A-7	0	0	100	100	100	95-100	40-50	20-30
	14-60	Silty clay	CH, CL	A-7	0	0	100	100	100	95-100	40-80	20-50
059VB: Verdigris-----	0-16	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	65-100	22-35	2-13
	16-60	Silt loam	CL	A-4, A-6, A-7	0	0	100	100	95-100	80-100	30-45	8-23
087EC: Eudora-----	0-6	Fine sandy loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	85-100	60-100	20-30	2-11
	6-12	Silt loam	CL, CL-ML, ML	A-4	0	0	100	100	95-100	65-100	0-25	NP-10
	12-18	Silt loam	CL, CL-ML, ML	A-4	0	0	100	100	95-100	65-100	0-25	NP-10
	18-25	Silt loam	CL, CL-ML, ML	A-4	0	0	100	100	95-100	65-100	0-25	NP-10
	25-44	Silt loam	CL, CL-ML, ML	A-4	0	0	100	100	95-100	65-100	0-25	NP-10
	44-60	Silt loam	CL, CL-ML, ML	A-4	0	0	100	100	95-100	65-100	0-25	NP-10
Bismarckgrove--	0-7	Fine sandy loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	85-100	60-100	20-30	2-11
	7-33	Silty clay loam	CL	A-6	0	0	100	100	90-100	70-90	30-44	11-22
	33-52	Silt loam	CL	A-4	0	0	100	100	85-95	50-90	21-34	4-9
	52-80	Loamy very fine sand	SC, SM	A-2-4, A-4	0	0	100	100	75-85	20-60	11-26	NP-8
087FU: Fluvaquents----	0-7	Silt loam	CL-ML, ML	A-4	0	0	100	100	85-100	80-100	0-30	4-10
	7-35		CL-ML, ML	A-4	0	0	100	100	90-100	90-100	0-30	4-10
	35-60		CL-ML, ML	A-4	0	0	100	100	85-100	80-100	0-25	4-10
087MU: Muscotah-----	0-6	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	85-95	45-55	25-35
	6-11	Silty clay loam	CH	A-7	0	0	100	100	95-100	85-95	50-65	30-40
	11-24	Silty clay	CH	A-7	0	0	100	100	95-100	85-95	50-65	30-40
	24-47	Silty clay			0	0	100	100	95-100	85-95	50-65	30-40
	47-60	Silty clay			0	0	100	100	95-100	85-95	50-65	30-40
091EB: Eudora-----	0-13	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	85-100	60-100	20-30	2-11
	13-60	Very fine sandy loam	CL, CL-ML, ML	A-4	0	0	100	100	95-100	65-100	15-25	NP-10
091MC: Morrill-----	0-13	Loam	CL	A-4, A-6	0	0	95-100	75-100	65-100	50-80	25-40	7-20
	13-22	Clay loam	CL, SC	A-6, A-7-6	0	0	85-100	70-100	55-100	25-80	30-45	11-25
	22-60	Clay loam	CL, ML, SC, SM	A-2, A-4, A-6	0	0	90-100	70-100	45-100	20-80	20-35	8-20
139CM: Clareson-----	0-8	Silty clay loam	CL	A-4, A-6	---	0-25	90-100	90-100	85-95	85-95	30-40	8-18
	8-16	Silty clay loam	CL	A-6, A-7	---	0-65	90-100	90-100	85-95	85-95	35-45	11-20
	16-24	Very flaggy silty clay loam	CH, CL	A-7	---	50-85	85-100	85-100	80-95	80-95	41-60	18-35
	24-32	Unweathered bedrock			---	---	---	---	---	---	---	---
Eram-----	0-9	Silty clay loam	CL	A-6, A-7	0	0	85-100	85-100	85-100	70-95	36-48	15-25
	9-28	Silty clay	CH, CL	A-7	0	0	95-100	95-100	90-100	80-98	43-61	21-35
	28-32	Weathered bedrock			---	---	---	---	---	---	---	---
139ED: Elmont-----	0-8	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	75-100	25-40	6-15
	8-16	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	75-100	25-40	6-15
	16-42	Clay loam	CL	A-6, A-7-6	0	0	100	100	95-100	85-100	35-45	15-25
	42-52	Clay loam	CL	A-6, A-7-6	0	0	95-100	90-100	85-100	80-100	35-50	15-30
	52-60	Unweathered bedrock			---	---	---	---	---	---	---	---
139LU: Lula-----	0-8	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	90-100	21-37	1-15
	8-14	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-25
	14-44	Silty clay loam	CL, CH	A-7	0	0-30	85-100	85-100	80-100	70-100	35-50	10-25
	44-52	Unweathered bedrock			---	---	---	---	---	---	---	---
177MF: Martin-----	0-12	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	80-100	35-45	15-25
	12-17	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	80-100	35-45	15-25
	17-60	Silty clay	CH, CL	A-7	0	0	100	100	95-100	80-100	40-70	25-40
177SW: Stony Steep Lan Vinland-----	---	---	---	---	---	---	---	---	---	---	---	---
	0-11	Silty clay loam	CL	A-6, A-7	0	0-5	80-100	75-100	70-100	65-95	35-45	15-20
	11-17	Silty clay loam	CL, SC	A-6, A-7	0	0	90-100	75-100	50-100	35-95	25-45	10-20
	17-20	Weathered bedrock			---	---	---	---	---	---	---	---

ENGINEERING INDEX PROPERTIES--Continued  
Douglas County, Kansas

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index	
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200			
					Pct	Pct							
601KW: Konawa-----	In												
	0-19	Fine sandy loam	CL, ML, SC, SM	A-4	0	0	100	98-100	94-100	36-60	15-30	NP-10	
	19-47	Clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	100	100	90-100	36-90	25-40	7-18	
	47-60	Clay loam	CL, ML, SC, SM	A-4, A-6	0	0	100	98-100	90-100	36-65	15-37	NP-16	
601SA: Sarpy-----	0-9	Loamy fine sand	SM	A-2-4	---	0	100	100	60-80	15-35	---	NP	
Haynie-----	9-60	Fine sand	SM, SP, SP-SM	A-2-4, A-3	---	0	100	100	60-80	2-35	---	NP	
	0-8	Very fine sandy loam	CL-ML, ML	A-4	---	0	100	100	85-100	70-100	15-25	NP-5	
	8-60	Very fine sandy loam	CL, CL-ML	A-4, A-6	---	0	100	100	85-100	85-100	25-35	5-15	
2326: Kenoma-----	0-4	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	85-100	85-100	85-100	85-100	25-40	3-18	
	4-10	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	85-100	85-100	85-100	85-100	25-40	3-18	
	10-18	Silty clay	CH	A-7	0	0	85-100	85-100	85-100	85-100	50-75	30-48	
	18-27	Silty clay	CH	A-7	0	0	85-100	85-100	85-100	85-100	50-75	30-48	
	27-41	Silty clay	CH	A-7	0	0	85-100	85-100	85-100	85-100	45-65	30-48	
	41-59	Silty clay	CH	A-7	0	0	85-100	85-100	85-100	85-100	45-65	30-48	
	59-73	Silty clay loam	CH, CL	A-7	0	0	85-100	85-100	75-100	75-95	45-65	25-44	
	2540: Leanna-----	0-10	Silt loam	CL	A-6	0	0	100	100	95-100	85-90	25-35	10-15
		10-22	Silt loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	30-45	10-20
22-40		Silty clay	CH, CL	A-7	0	0	100	100	95-100	90-100	45-60	20-30	
40-55		Silty clay	CH, CL	A-6, A-7	0	0	100	100	95-100	90-100	35-55	15-30	
55-78		Silty clay	CH, CL	A-6, A-7	0	0	100	100	95-100	90-100	35-55	15-30	
2797: Morrill, stony-	0-10	Gravelly loam	CL, SC	A-6	1-3	1-3	80-100	70-100	65-100	25-80	30-35	10-15	
	10-15	Gravelly clay loam	CL, SC	A-6	0	0-3	80-100	70-100	65-100	25-80	30-35	10-15	
	15-42	Gravelly clay loam	CL, SC	A-2, A-6, A-7	0	0-3	80-100	70-100	65-100	25-80	35-45	15-22	
	42-60	Gravelly sandy clay loam	CL, GC, SC	A-2, A-6, A-7	0	0-3	80-100	70-100	40-75	20-60	30-45	10-22	
3460: Sibleyville----	0-7	Loam	CL, CL-ML	A-4, A-6	0	0	100	85-100	70-95	50-75	25-35	5-15	
	7-15	Loam	SC, CL	A-6	0	0	100	85-100	70-90	30-55	30-40	11-20	
	15-27	Channery loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0-20	70-90	70-90	50-90	25-70	25-40	5-20	
	27-31	Weathered bedrock			---	---	---	---	---	---	---	---	
Vinland-----	0-7	Loam	CL, SC	A-6	0	0-5	80-100	75-100	65-95	45-75	25-35	10-15	
	7-10	Silty clay loam	CL, SC	A-6, A-7	0	0-5	90-100	75-100	50-100	35-95	25-45	10-15	
	10-17	Silty clay loam	CL, SC	A-6, A-7	0	0	90-100	75-100	50-100	35-95	25-45	10-20	
	17-21	Weathered bedrock			---	---	---	---	---	---	---	---	
3461: Sibleyville, eroded-----	0-5	Loam	CL, CL-ML	A-4, A-6	0	0	100	85-100	70-95	50-75	25-35	5-15	
	5-12	Clay loam	CL, SC	A-6	0	0	100	85-100	70-90	30-55	30-40	11-20	
	12-27	Channery loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0-20	70-90	70-90	50-90	25-70	25-40	5-20	
	27-31	Weathered bedrock			---	---	---	---	---	---	---	---	
3462: Sibleyville----	0-7	Loam	CL, CL-ML	A-4, A-6	0	0	100	85-100	70-95	50-75	25-35	5-15	
	7-15	Loam	CL, SC	A-6	0	0	100	85-100	70-90	30-55	30-40	11-20	
	15-27	Channery loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0-20	70-90	70-90	50-90	25-70	25-40	5-20	
	27-31	Weathered bedrock			---	---	---	---	---	---	---	---	
3464: Sibleyville----	0-7	Loam	CL, CL-ML	A-4, A-6	0	0	100	85-100	70-95	50-75	25-35	5-15	
	7-15	Loam	SC, CL	A-6	0	0	100	85-100	70-90	30-55	30-40	11-20	
	15-27	Channery loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0-20	70-90	70-90	50-90	25-70	25-40	5-20	
	27-32	Weathered bedrock			---	---	---	---	---	---	---	---	
Vinland-----	0-7	Loam	CL, SC	A-6	0	0-5	80-100	75-100	65-95	45-75	25-35	10-15	
	7-10	Silty clay loam	CL, SC	A-6, A-7	0	0-5	90-100	75-100	50-100	35-95	25-45	10-15	
	10-17	Silty clay loam	CL, SC	A-6, A-7	0	0	90-100	75-100	50-100	35-95	25-45	10-20	
	17-30	Weathered bedrock			---	---	---	---	---	---	---	---	
3494: Summit-----	0-9	Silty clay loam	CH, CL, ML	A-6, A-7	0	0	90-100	85-100	80-100	70-99	35-60	11-30	
	9-17	Silty clay	CH, CL	A-6, A-7	0	0	85-100	85-100	75-100	60-99	37-65	15-35	
	17-24	Silty clay	CH, CL	A-7	0	0	85-100	75-100	70-100	55-98	41-70	18-40	
	24-41	Silty clay	CH, CL	A-7	0	0	85-100	75-100	70-100	55-98	41-70	18-40	
	41-61	Silty clay	CH, CL	A-7	0	0	85-100	75-100	70-100	55-98	41-70	18-40	
	61-73	Silty clay	CH, CL	A-7	0	0	85-100	75-100	70-100	55-98	41-70	18-40	

ENGINEERING INDEX PROPERTIES--Continued  
Douglas County, Kansas

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
3495: Summit-----	0-9	Silty clay loam	CH, CL	A-6, A-7	0	0	90-100	85-100	80-100	70-99	35-60	11-30
	9-17	Silty clay	CH, CL	A-6, A-7	0	0	85-100	85-100	75-100	60-99	37-65	15-35
	17-24	Silty clay	CH, CL	A-7	0	0	85-100	75-100	70-100	55-98	41-70	18-40
	24-41	Silty clay	CH, CL	A-7	0	0	85-100	75-100	70-100	55-98	41-70	18-40
	41-61	Silty clay	CH, CL	A-7	0	0	85-100	75-100	70-100	55-98	41-70	18-40
	61-73	Silty clay	CH, CL	A-7	0	0	85-100	75-100	70-100	55-98	41-70	18-40
3815: Verdigris-----	0-9	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	65-100	22-35	2-13
	9-27	Silt loam	CL	A-4, A-6, A-7	0	0	100	100	95-100	80-100	30-45	8-23
	27-32	Silt loam	CL	A-4, A-6, A-7	0	0	100	100	95-100	80-100	30-45	8-23
	32-52	Silt loam	CL	A-4, A-6, A-7	0	0	100	100	95-100	80-100	30-45	8-23
	52-60	Silt loam	CL	A-4, A-6, A-7	0	0	100	100	95-100	80-100	30-45	8-23
3926: Water (less Tha 40-----	---	---	---	---	---	---	---	---	---	---	---	---
3951: Woodson-----	0-10	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	5-20
	10-21	Silty clay	CH	A-7-6	0	0	100	95-100	95-100	90-100	50-65	30-45
	21-30	Silty clay	CH, CL	A-7-6	0	0	100	95-100	95-100	90-100	50-65	30-45
	30-48	Silty clay	CH, CL	A-7-6	0	0	100	95-100	95-100	90-100	45-65	20-40
	48-60	Silty clay	CH, CL	A-7-6	0	0	100	95-100	95-100	90-100	45-65	20-40
AED: Arents, Earthen Dam-----	---	---	---	---	---	---	---	---	---	---	---	---
Be: Basehor-----	0-12	Loam	CL, ML	A-4	---	0-15	80-100	80-100	70-95	50-75	15-30	NP-10
	12-16	Unweathered bedrock			---	---	---	---	---	---	---	---
BOP: Borrow Pits----	---	---	---	---	---	---	---	---	---	---	---	---
Et: Eudora-----	0-12	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	85-100	60-100	20-30	2-11
	12-72	Silt loam	CL, CL-ML, ML	A-4	0	0	100	100	95-100	65-100	15-25	NP-10
Ev: Eudora-----	0-12	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	85-100	60-100	20-30	2-11
	12-72	Silt loam	CL, CL-ML, ML	A-4	0	0	100	100	95-100	65-100	15-25	NP-10
	0-6	Silty clay loam	CH, CL	A-7-6	0	0	100	100	95-100	90-100	45-65	20-40
	6-28	Silty clay	CH, CL	A-7-6	0	0	100	100	95-100	90-100	45-65	20-40
	28-60	Silt loam	CL-ML, ML	A-4	0	0	100	100	95-100	50-100	15-15	NP-4
Ew: Eudora-----	0-12	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	100	70-85	40-55	15-26	NP-10
	12-72		CL, CL-ML, ML	A-4	0	0	100	100	95-100	65-100	15-25	NP-10
	0-15	Fine sandy loam	CL, ML, SC, SM	A-4	0	0	100	100	90-100	45-70	15-25	NP-10
	15-28	Silty clay	CH, CL	A-7-6	0	0	100	100	95-100	90-100	45-65	20-40
	28-60	Silt loam	CL-ML, ML	A-4	0	0	100	100	95-100	50-100	15-25	NP-4
Gm: Gymer-----	0-15	Silt loam	CL, ML	A-4, A-6	0	0	100	100	95-100	75-100	25-40	8-20
	15-30	Silty clay loam	CH, CL	A-6, A-7	0	0	100	100	95-100	85-100	35-55	15-30
	30-80	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-45	11-25
Gy: Gymer-----	0-15	Silt loam	CL, ML	A-4, A-6	0	0	100	100	95-100	75-100	25-40	8-20
	15-34	Silty clay loam	CH, CL	A-6, A-7	0	0	100	100	95-100	85-100	35-55	15-30
	34-68	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-45	11-25
Ju: Judson-----	0-21	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	100	95-100	25-35	5-15
	21-47	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	30-50	15-25
	47-60	Silt loam	CL, CL-ML	A-4, A-6, A-7	0	0	100	100	100	95-100	25-50	5-25
KA: Kennebec-----	0-45	Silt loam	CL	A-6, A-7	0	0	100	100	95-100	90-100	25-45	10-20
	45-72	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-15
Kb: Kennebec-----	0-48	Silt loam	CL	A-6, A-7	0	0	100	100	95-100	90-100	25-45	10-20
	48-60	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-15
Kc: Kennebec-----	0-10	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-45	10-20
	10-60	Silty clay loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-15
Km: Kimo-----	0-6	Silty clay loam	CH, CL	A-7-6	0	0	100	100	95-100	90-100	45-65	20-40
	6-28	Silty clay	CL, CH	A-7-6	0	0	100	100	95-100	90-100	45-65	20-40
	28-60	Silt loam	CL-ML, ML	A-4	0	0	100	100	95-100	50-100	15-15	NP-4
Le: Leanna-----	0-22	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	85-100	25-40	5-20
	22-40	Silty clay	CH, CL	A-7	0	0	100	100	95-100	90-100	45-65	25-40
	40-78	Silty clay	CH, CL	A-6, A-7	0	0	100	100	95-100	90-100	35-55	20-35
M-W: Miscellaneous Water-----	---	---	---	---	---	---	---	---	---	---	---	---
Mb: Martin-----	0-9	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	80-100	35-45	15-25
	9-14	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	80-100	35-45	15-25
	14-60	Silty clay	CH, CL	A-7	0	0	100	100	95-100	80-100	40-70	25-40
Mc: Martin-----	0-9	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	80-100	35-45	15-25
	9-14	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	80-100	35-45	15-25
	14-60	Silty clay	CH, CL	A-7	0	0	100	100	95-100	80-100	40-70	25-40



ENGINEERING INDEX PROPERTIES--Continued  
Douglas County, Kansas

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Mh:												
Martin, eroded-	0-9	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	80-100	35-45	15-25
	9-14	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	80-100	35-45	15-25
	14-60	Silty clay	CH, CL	A-7	0	0	100	100	95-100	80-100	40-70	25-40
Mo:												
Martin-----	0-9	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	80-100	35-45	15-25
	9-14	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	80-100	35-45	15-25
	14-60	Silty clay	CH, CL	A-7	0	0	100	100	95-100	80-100	40-70	25-40
Oska-----	0-5	Silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-25
	5-38	Silty clay	CH, CL	A-7	0	0	100	100	95-100	95-100	45-60	20-35
	38-42	Unweathered bedrock			---	---	---	---	---	---	---	---
Mr:												
Morrill-----	0-10	Clay loam	CL	A-4, A-6	0	0	95-100	75-100	65-100	50-80	25-40	7-20
	10-56	Clay loam	CL, SC	A-6, A-7-6	0	0	85-100	70-100	55-100	25-80	30-45	11-25
	56-66	Clay loam	CL, ML, SC, SM	A-2, A-4, A-6	0	0	90-100	70-100	45-100	20-80	20-35	8-20
Ms:												
Morrill-----	0-10	Clay loam	CL	A-4, A-6	0	0	95-100	75-100	65-100	50-80	25-40	7-20
	10-56	Clay loam	CL, SC	A-6, A-7-6	0	0	85-100	70-100	55-100	25-80	30-45	11-25
	56-66	Clay loam	CL, ML, SC, SM	A-2, A-4, A-6	0	0	90-100	70-100	45-100	20-80	20-35	8-20
Oe:												
Oska-----	0-5	Silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-25
	5-38	Silty clay	CH, CL	A-7	0	0	100	100	95-100	95-100	45-60	20-35
	38-42	Unweathered bedrock			---	---	---	---	---	---	---	---
Pb:												
Pawnee-----	0-14	Clay loam	CL	A-6	0	0	95-100	95-100	85-100	70-90	30-40	10-20
	14-34	Clay	CH	A-7	0	0	95-100	95-100	85-100	70-85	50-70	25-45
	34-72	Sandy clay loam	CH, CL	A-6, A-7	0	0	95-100	95-100	80-100	70-90	35-55	20-40
Pc:												
Pawnee-----	0-14	Clay loam	CL	A-6	0	0	95-100	95-100	85-100	70-90	30-40	10-20
	14-34	Clay	CH	A-7	0	0	95-100	95-100	85-100	70-85	50-70	25-45
	34-72	Sandy clay loam	CH, CL	A-6, A-7	0	0	95-100	95-100	80-100	70-90	35-55	20-40
Ph:												
Pawnee, eroded-	0-14	Clay loam	CL	A-6	0	0	95-100	95-100	85-100	70-90	30-40	10-20
	14-34	Clay	CH	A-7	0	0	95-100	95-100	85-100	70-85	50-70	25-45
	34-72	Sandy clay loam	CH, CL	A-6, A-7	0	0	95-100	95-100	80-100	70-90	35-55	20-40
QUA:												
Quarries-----	---	---	---	---	---	---	---	---	---	---	---	---
Re:												
Reading-----	0-15	Silt loam	CL	A-6	0	0	100	100	90-100	80-90	30-35	10-15
	15-41	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	35-45	15-20
	41-60	Silty clay	CL	A-6, A-7	0	0	100	100	95-100	80-95	40-50	20-30
Ro:												
River Wash----	---	---	---	---	---	---	---	---	---	---	---	---
Sa:												
Sand Pit-----	---	---	---	---	---	---	---	---	---	---	---	---
Sb:												
Sarpy-----	0-12	Loamy fine sand	SM	A-2-4	0	0	100	100	60-80	15-35	---	NP
	12-60	Fine sand	SM, SP, SP-SM	A-2-4, A-3	0	0	100	100	60-80	2-35	---	NP
Eudora-----	0-8	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	100	70-85	40-55	15-26	NP-10
	8-60	Silt loam	CL, CL-ML, ML	A-4	0	0	100	100	95-100	65-100	15-25	NP-10
Sc:												
Sharpsburg-----	0-12	Silt loam	CL	A-6	0	0	100	100	100	95-100	25-40	10-20
	12-27	Silty clay loam	CH, CL	A-7	0	0	100	100	100	95-100	40-60	20-35
	27-36	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	20-30
	36-60	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	20-30
Sd:												
Sharpsburg-----	0-12	Silt loam	CL	A-6	0	0	100	100	100	95-100	25-40	10-20
	12-27	Silty clay loam	CH, CL	A-7	0	0	100	100	100	95-100	40-60	20-35
	27-36	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	20-30
	36-60	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	20-30
Sh:												
Sibleyville----	0-7	Loam	CL, CL-ML	A-4, A-6	0	0	100	85-100	70-95	50-75	25-35	5-15
	7-15	Loam	CL, SC	A-6	0	0	100	85-100	70-90	30-55	30-40	11-20
	15-27	Channery loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0-20	70-90	70-90	50-90	25-70	25-40	5-20
	27-31	Weathered bedrock			---	---	---	---	---	---	---	---
So:												
Sibleyville, eroded-----	0-5	Loam	CL, CL-ML	A-4, A-6	0	0	100	85-100	70-95	50-75	25-35	5-15
	5-12	Clay loam	CL, SC	A-6	0	0	100	85-100	70-90	30-55	30-40	11-20
	12-27	Channery loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0-20	70-90	70-90	50-90	25-70	25-40	5-20
	27-31	Weathered bedrock			---	---	---	---	---	---	---	---
Ss:												
Sibleyville----	0-7	Loam	CL, CL-ML	A-4, A-6	0	0	100	85-100	70-95	50-75	25-35	5-15
	7-15	Loam	CL, SC	A-6	0	0	100	85-100	70-90	30-55	30-40	11-20
	15-27	Channery loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0-20	70-90	70-90	50-90	25-70	25-40	5-20
	27-31	Weathered bedrock			---	---	---	---	---	---	---	---

ENGINEERING INDEX PROPERTIES--Continued  
Douglas County, Kansas

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
					Pct	Pct					Pct	
St: Sibleyville, eroded-----	In											
	0-7	Loam	CL, CL-ML	A-4, A-6	0	0	100	85-100	70-95	50-75	25-35	5-15
	7-15	Loam	CL, SC	A-6	0	0	100	85-100	70-90	30-55	30-40	11-20
	15-27	Channery loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0-20	70-90	70-90	50-90	25-70	25-40	5-20
	27-31	Weathered bedrock			---	---	---	---	---	---	---	---
SU: Summit-----	0-8	Silty clay loam	CH, CL, MH	A-6, A-7	0	0	90-100	85-100	80-100	70-99	35-60	11-30
	8-13	Silty clay loam	CH, CL, MH	A-6, A-7	0	0	85-100	85-100	75-100	60-99	37-65	15-35
	13-60	Silty clay	CH, CL, MH	A-7	0	0	85-100	75-100	70-100	55-98	41-70	18-40
Sv: Sibleyville----	0-7	Loam	CL, CL-ML	A-4, A-6	0	0	100	85-100	70-95	50-75	25-35	5-15
	7-15	Loam	CL, SC	A-6	0	0	100	85-100	70-90	30-55	30-40	11-20
	15-27	Channery loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0-20	70-90	70-90	50-90	25-70	25-40	5-20
	27-31	Weathered bedrock			---	---	---	---	---	---	---	---
SVV: Sibleyville----	0-8	Loam	CL, CL-ML	A-4, A-6	0	0	100	85-100	70-95	50-75	25-35	5-15
	8-22	Loam	CL, SC	A-6	0	0	100	85-100	70-90	30-55	30-40	11-20
	22-29	Channery loam	CL, CL-ML, SC, SC-SM	A-6, A-2, A-4	0	0-20	70-90	70-90	50-90	25-70	25-40	5-20
	29-33	Weathered bedrock			---	---	---	---	---	---	---	---
Vinland-----	0-18	Loam	CL, SC	A-4, A-6	0	0-5	80-100	75-100	65-95	45-75	25-35	10-15
	18-22	Weathered bedrock			---	---	---	---	---	---	---	---
Sw: Sogn-----	0-12	Silty clay loam	CH, CL, MH, ML	A-6, A-7	0	0-10	85-100	85-100	85-100	70-100	25-55	10-25
	12-16	Unweathered bedrock			---	---	---	---	---	---	---	---
Vinland-----	0-7	Silty clay loam	CL	A-6, A-7	0	0-5	80-100	75-100	70-100	65-95	35-45	15-20
	7-17	Silty clay loam	CL, SC	A-6, A-7	0	0	90-100	75-100	50-100	35-95	25-45	10-20
	17-21	Weathered bedrock			---	---	---	---	---	---	---	---
Sx: Rock Outcrop---	0-5	Unweathered bedrock			---	---	---	---	---	---	---	---
Vinland-----	0-7	Silty clay loam	CL	A-6, A-7	0	0-5	80-100	75-100	70-100	65-95	35-45	15-20
	7-17	Silty clay loam	CL, SC	A-6, A-7	0	0	90-100	75-100	50-100	35-95	25-45	10-20
	17-21	Weathered bedrock			---	---	---	---	---	---	---	---
Tc: Thurman-----	0-22	Loamy sand	SM, SP-SM	A-2, A-3, A-4	0	0	100	100	90-100	5-40	15-20	NP
	22-32	Loamy fine sand	SM, SP-SM	A-2, A-3, A-4	0	0	100	100	90-100	5-40	15-20	NP
	32-60	Fine sand	SM, SP-SM	A-2, A-3	0	0	100	100	50-95	5-35	10-15	NP
VA: Verdigris-----	0-7	Silt loam	CL-ML, ML, CL	A-4, A-6	0	0	100	100	95-100	65-100	25-36	7-15
	7-60	Silt loam	CL	A-4, A-6, A-7	0	0	100	100	95-100	80-100	28-43	9-21
Vc: Vinland-----	0-12	Silty clay loam	CL	A-6, A-7	0	0-5	80-100	75-100	70-100	65-95	35-45	15-20
	12-16	Silty clay loam	CL, SC, ML	A-6, A-7	0	0	90-100	75-100	50-100	35-95	25-45	10-20
	16-20	Weathered bedrock			---	---	---	---	---	---	---	---
Vh: Vinland-----	0-7	Silty clay loam	CL	A-6, A-7	0	0-5	80-100	75-100	70-100	65-95	35-45	15-20
	7-17	Silty clay loam	CL, SC	A-4, A-6, A-7	0	0	90-100	75-100	50-100	35-95	25-45	10-20
	17-21	Weathered bedrock			---	---	---	---	---	---	---	---
Vm: Vinland-----	0-7	Silty clay loam	CL	A-6, A-7	0	0-5	80-100	75-100	70-100	65-95	35-45	15-20
	7-17	Silty clay loam	CL, SC	A-6, A-7	0	0	90-100	75-100	50-100	35-95	25-45	10-20
	17-21	Weathered bedrock			---	---	---	---	---	---	---	---
Martin-----	0-9	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	80-100	35-45	15-25
	9-14	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	80-100	35-45	15-25
	14-60	Silty clay	CH, CL	A-7	0	0	100	100	95-100	80-100	40-70	25-40
W: Water (< 40 Acres)-----	---	---	---	---	---	---	---	---	---	---	---	---
Wc: Wabash-----	0-16	Silty clay loam	CH, CL	A-6, A-7	0	0	100	100	100	95-100	35-55	15-35
	16-70	Silty clay	CH	A-7	0	0	100	100	100	95-100	52-78	30-55
Wh: Wabash-----	0-16	Silty clay	CH	A-7	0	0	100	100	100	95-100	50-75	30-50
	16-70	Silty clay	CH	A-7	0	0	100	100	100	95-100	52-78	30-55
Wo: Woodson-----	0-11	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	5-20
	11-45	Silty clay	CH	A-7-6	0	0	100	95-100	90-100	50-65	30-45	
	45-78	Silty clay loam	CH, CL	A-7-6	0	0	100	95-100	95-100	90-100	45-65	20-40
Ws: Woodson-----	0-11	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	5-20
	11-45	Silty clay	CH	A-7-6	0	0	100	95-100	90-100	50-65	30-45	
	45-78	Silty clay loam	CH, CL	A-7-6	0	0	100	95-100	95-100	90-100	45-65	20-40

ENGINEERING INDEX PROPERTIES--Continued  
Douglas County, Kansas

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
					Pct	Pct					Pct	
Wx: Woodson, eroded	In											
	0-8	Silty clay loam	CL	A-6	0	0	100	100	90-100	85-100	30-40	10-20
	8-45	Silty clay	CH	A-7-6	0	0	100	95-100	95-100	90-100	50-65	30-45
	45-78	Silty clay	CH, CL	A-7-6	0	0	100	95-100	95-100	90-100	45-65	20-40

Physical Properties table shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In this table, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In this table, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earth moving operations.

Moist bulk density is the weight of soil (oven-dry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3- or 1/10-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability ( $K \rightarrow \text{sat}$ ) refers to the ability of a soil to transmit water or air. The term "permeability," as used in soil surveys, indicates saturated hydraulic conductivity ( $K \rightarrow \text{sat}$ ). The estimates in the table indicate the rate of water movement, in inches per hour, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In Physical Properties table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter. The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in the Physical Properties table as the K factor ( $K_w$  and  $K_f$ ) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor  $K_w$  indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor  $K_f$  indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to

wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are as follows:

1. Coarse sands, sands, fine sands, and very fine sands.
2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, ash material, and sapric soil material.
3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.
- 4L. Calcareous loams, silt loams, clay loams, and silty clay loams.
4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.
5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.
6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.
7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.
8. Soils that are not subject to wind erosion because of coarse fragments on the surface or because of surface wetness.

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

#### Explanation of Wind Erodibility Groups

Soil erodibility by wind is directly related to the percentage of dry non-erodible surface soil aggregates larger than 0.84 mm in diameter. From this percentage, the wind erodibility index (I-factor) is determined. The I-factor is an expression of the stability of these soil aggregates against breakdown by tillage and abrasion from wind erosion. Soils are placed in Wind Erodibility Groups (WEG) having similar percentages of dry soil aggregates larger than 0.84 mm as shown in the following table.

WEG	Properties of Soil Surface Layer	Dry Soil Aggregates >0.84mm Percent	Wind Erodibility Index T/Ac/Yr (I)
1	Very fine sand, fine sand, sand, or coarse sand	1 2 3 5 7	310 1/ 250 220 180 160
2	Loamy very fine sand, loamy fine sand, loamy sand, loamy coarse sand, organic soil materials.	10	134
3	Very fine sandy loam, fine sandy loam, sandy loam, or coarse sandy loam.	25	86
4	Clay, silty clay, non-calcareous clay loam, or silty clay loam with >35 percent clay content.	25	86
4L	Calcareous 2/ loam, silt loam, clay loam, or silty clay loam.	25	86
5	Non-calcareous loam and silt loam with <20 percent clay content, or sandy clay loam, sandy clay, and hemic 3/ organic soil materials.	40	56
6	Non-calcareous loam and silt loam with >20 percent clay content, or non-calcareous clay loam with <35 percent clay content.	45	48
7	Silt, non-calcareous silty clay loam with >35 percent clay content and fibric 3/ organic soil material.	50	38
8	Soils not suitable for cultivation due to coarse fragments or wetness; wind erosion is not a problem.	--	0

1/ The "I" values for WEG 1 vary from 160 for coarse sands to 310 for very fine sands. Use an "I" of 220 as an average figure. For coarser sand that has gravel, use a lower figure. For a soil that has no gravel and very fine sand, use a higher figure. (Modification for coarse fragments is preparation.)

2/ Calcareous is a strongly or violently effervescent reaction to cold dilute (1N) HCL.

3/ See Soil Taxonomy for definition.

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(Single entries under "Sand and Silt" are a representative percentage are calculated using an algorithm. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer)

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
059BC: Bates-----	0-19 19-34 34-38 38-42	40-65 40-60 40-65 ---	20-40 20-40 20-30 ---	15-27 18-35 18-30 ---	1.40-1.50 1.50-1.60 1.40-1.50 ---	0.60-2.00 0.60-2.00 0.60-2.00 ---	0.20-0.24 0.15-0.19 0.14-0.16 ---	0.0-2.9 0.0-2.9 0.0-2.9 ---	1.0-4.0 1.0-3.0 0.5-1.0 ---	.32 .28 .20 ---	.32 .32 .43 ---	3	5	56
059BD: Bates-----	0-19 19-34 34-38 38-42	40-65 40-60 40-65 ---	20-40 20-40 20-30 ---	15-27 18-35 18-30 ---	1.40-1.50 1.50-1.60 1.40-1.50 ---	0.60-2.00 0.60-2.00 0.60-2.00 ---	0.20-0.24 0.15-0.19 0.14-0.16 ---	0.0-2.9 0.0-2.9 0.0-2.9 ---	1.0-4.0 1.0-3.0 0.5-1.0 ---	.32 .28 .20 ---	.32 .32 .43 ---	3	5	56
Collinsville-	0-11 11-17 17-21	30-70 30-70 ---	28-50 10-50 ---	7-20 5-20 ---	1.30-1.55 1.40-1.70 ---	2.00-6.00 2.00-6.00 ---	0.13-0.20 0.07-0.20 ---	0.0-2.9 0.0-2.9 ---	1.0-3.0 0.1-0.3 ---	.32 .20 ---	.32 .28 ---	1	5	56
059BH: Bates-----	0-19 19-26 26-34 34-38	40-65 40-60 40-55 ---	20-40 20-40 20-30 ---	15-27 18-35 18-30 ---	1.40-1.50 1.50-1.60 1.40-1.50 ---	0.60-2.00 0.60-2.00 0.60-2.00 ---	0.20-0.24 0.15-0.19 0.14-0.16 ---	0.0-2.9 0.0-2.9 0.0-2.9 ---	1.0-4.0 1.0-3.0 0.5-1.0 ---	.32 .28 .20 ---	.32 .32 .43 ---	3	5	56
Collinsville-	0-11 11-17 17-21	30-70 30-70 ---	28-50 10-50 ---	7-20 5-20 ---	1.30-1.55 1.40-1.70 ---	2.00-6.00 2.00-6.00 ---	0.13-0.20 0.07-0.20 ---	0.0-2.9 0.0-2.9 ---	1.0-3.0 0.1-0.3 ---	.32 .20 ---	.32 .28 ---	1	5	56
059BS: Bolivar-----	0-13 13-28 28-34 34-38	40-50 20-50 20-50 ---	28-50 20-50 20-50 ---	15-27 20-35 25-32 ---	1.20-1.40 1.30-1.50 1.35-1.55 ---	0.60-2.00 0.60-2.00 0.60-2.00 ---	0.19-0.21 0.12-0.16 0.09-0.12 ---	0.0-2.9 3.0-5.9 0.0-2.9 ---	0.5-3.0 0.2-1.0 0.1-0.5 ---	.24 .32 .24 ---	.32 .32 .32 ---	3	5	56
Hector-----	0-9 9-18 18-22	30-50 30-50 ---	30-50 30-50 ---	5-20 10-25 ---	1.30-1.60 1.30-1.60 ---	2.00-6.00 2.00-6.00 ---	0.10-0.14 0.08-0.15 ---	0.0-2.9 0.0-2.9 ---	0.5-2.0 0.2-1.0 ---	.24 .17 ---	.28 .28 ---	1	5	56
059CM: Clareson-----	0-7 7-15 15-26 26-30	1-10 1-10 1-10 ---	50-70 50-70 40-60 ---	27-40 27-40 35-50 ---	1.25-1.35 1.30-1.40 1.35-1.45 ---	0.60-2.00 0.20-2.00 0.06-0.20 ---	0.16-0.22 0.09-0.21 0.04-0.07 ---	3.0-5.9 3.0-5.9 6.0-8.9 ---	2.5-4.0 2.0-3.0 1.0-3.0 ---	.32 .24 .24 ---	.32 .43 .64 ---	2	7	38
Eram-----	0-7 7-38 38-42	1-20 1-25 ---	50-70 30-60 ---	27-40 35-55 ---	1.30-1.60 1.35-1.65 ---	0.20-0.60 0.06-0.20 ---	0.15-0.20 0.10-0.18 ---	3.0-5.9 6.0-8.9 ---	1.0-3.0 0.5-1.5 ---	.37 .37 ---	.37 .37 ---	3	7	38
059DN: Dennis-----	0-10 10-15 15-60	10-30 10-25 10-20	50-70 45-65 30-55	10-27 27-35 35-55	1.25-1.40 1.35-1.45 1.35-1.55	0.60-2.00 0.20-0.60 0.06-0.20	0.15-0.20 0.15-0.20 0.15-0.20	1.5-4.5 3.0-5.9 6.0-8.9	1.0-3.0 1.0-2.0 0.5-1.5	.43 .37 .37	.43 .37 .37	5	6	48
Bates-----	0-19 19-26 26-34 34-38	40-65 40-60 40-56 ---	20-40 20-40 20-30 ---	15-27 18-35 18-30 ---	1.40-1.50 1.40-1.60 1.40-1.50 ---	0.60-2.00 0.60-2.00 0.60-2.00 ---	0.20-0.24 0.15-0.19 0.14-0.16 ---	0.0-2.9 0.0-2.9 0.0-2.9 ---	1.0-4.0 1.0-3.0 0.5-1.0 ---	.32 .32 .20 ---	.32 .32 .43 ---	3	5	56
059EA: Eram-----	0-7 7-38 38-42	1-20 1-25 ---	50-70 30-60 ---	27-40 35-55 ---	1.30-1.60 1.35-1.65 ---	0.20-0.60 0.06-0.20 ---	0.15-0.20 0.10-0.18 ---	3.0-5.9 6.0-8.9 ---	1.0-3.0 0.5-1.5 ---	.37 .37 ---	.37 .37 ---	3	7	38
Lebo-----	0-14 14-28 28-36	5-20 5-20 ---	50-70 50-60 ---	22-35 22-35 ---	1.35-1.45 1.40-1.50 ---	0.60-2.00 0.60-2.00 ---	0.21-0.23 0.15-0.18 ---	3.0-5.9 3.0-5.9 ---	2.0-3.0 1.0-2.0 ---	.32 .24 ---	.32 .37 ---	3	7	38
059EC: Eram-----	0-7 7-38 38-42	5-20 5-25 ---	50-70 30-60 ---	27-40 35-55 ---	1.30-1.60 1.35-1.65 ---	0.20-0.60 0.06-0.20 ---	0.15-0.20 0.10-0.18 ---	3.0-5.9 6.0-8.9 ---	1.0-3.0 0.5-1.5 ---	.37 .37 ---	.37 .37 ---	3	7	38
Lula-----	0-7 7-12 12-44 44-52	1-10 1-25 1-25 ---	50-75 40-70 45-65 ---	15-30 18-35 27-40 ---	1.20-1.40 1.30-1.50 1.30-1.50 ---	0.60-2.00 0.60-2.00 0.60-2.00 ---	0.16-0.20 0.16-0.20 0.16-0.20 ---	0.0-2.9 3.0-5.9 6.0-8.9 ---	1.0-3.0 1.0-2.0 0.2-0.6 ---	.37 .37 .37 ---	.37 .37 .37 ---	3	6	48
059LN: Lebo-----	0-7 7-14 14-28 28-36	5-20 5-20 5-20 ---	50-70 50-65 50-60 ---	22-35 22-35 22-35 ---	1.35-1.45 1.40-1.50 1.45-1.65 ---	0.60-2.00 0.60-2.00 0.60-2.00 ---	0.07-0.18 0.15-0.18 0.07-0.10 ---	3.0-5.9 3.0-5.9 3.0-5.9 ---	2.0-3.0 1.0-2.0 0.5-1.5 ---	.24 .37 .24 ---	.64 .37 .64 ---	3	8	0
Rock Outcrop-	---	---	---	---	---	---	---	---	---	---	---	---	---	0
059MB: Mason-----	0-7 7-60	1-10 1-25	50-75 45-70	12-27 20-35	1.30-1.50 1.40-1.70	0.60-2.00 0.20-0.60	0.16-0.20 0.16-0.20	0.0-2.9 3.0-5.9	1.0-3.0 0.5-1.0	.37 .37	.37 .37	5	6	48
059OS: Osage-----	0-14 14-60	1-5 1-5	50-65 35-60	32-40 35-60	1.30-1.40 1.40-1.50	0.00-0.06 0.00-0.06	0.21-0.23 0.08-0.12	6.0-8.9 9.0-25.0	1.0-4.0 0.5-2.0	.37 .28	.37 .28	5	4	86
059VB: Verdigris----	0-16 16-60	5-20 5-20	50-75 50-75	15-27 18-35	1.30-1.40 1.40-1.60	0.60-2.00 0.60-2.00	0.20-0.24 0.17-0.22	1.5-4.5 3.0-5.9	2.0-4.0 0.5-1.5	.32 .32	.32 .32	5	6	48

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(Single entries under "Sand and Silt" are a representative percentage are calculated using an algorithm. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer)

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
087EC: Eudora-----	In	Pct	Pct	Pct	g/cc	in/hr	In/in	Pct	Pct					
	0-6	40-60	40-80	5-18	1.30-1.50	2.00-6.00	0.20-0.24	0.0-2.9	0.5-1.0	.32	.32	5	5	56
	6-12	10-50	40-80	5-18	1.35-1.50	0.60-2.00	0.17-0.22	0.0-2.9	1.0-2.0	.43	.43			
	12-18	10-50	40-80	5-18	1.35-1.50	0.60-2.00	0.17-0.22	0.0-2.9	0.5-1.5	.43	.43			
	18-25	10-50	40-80	5-18	1.35-1.50	0.60-2.00	0.17-0.22	0.0-2.9	0.5-0.9	.43	.43			
	25-44	10-50	40-75	5-18	1.35-1.50	0.60-2.00	0.17-0.22	0.0-2.9	0.2-0.6	.43	.43			
	44-60	10-75	40-75	5-18	1.35-1.50	0.60-2.00	0.17-0.22	0.0-2.9	0.1-0.3	.43	.43			
Bismarckgrove	0-7	40-60	40-80	5-18	1.30-1.50	2.00-6.00	0.20-0.24	0.0-2.9	0.5-1.0	.32	.32	5	7	38
	7-33	1-20	50-70	18-35	1.35-1.45	0.60-2.00	0.18-0.21	3.0-5.9	2.0-4.0	.32	.32			
	33-52	20-60	10-60	7-18	1.35-1.40	0.60-2.00	0.17-0.19	0.0-2.9	1.0-2.0	.43	.43			
	52-80	55-90	5-15	5-15	1.55-1.60	0.60-2.00	0.01-0.05	0.0-2.9	0.2-0.8	.17	.17			
087FU: Fluvaquents--	0-7			10-18	1.20-1.40	0.60-2.00	0.18-0.23	0.0-2.9	1.0-2.0	.37	.37	5	4L	86
	7-35			5-18	1.25-1.45	0.60-2.00	0.18-0.23	0.0-2.9	---	.37	.37			
	35-60			5-18	1.35-1.50	0.60-2.00	0.15-0.20	0.0-2.9	---	.37	.37			
087MU: Muscotah-----	0-6	1-10	50-70	27-40	1.30-1.40	0.20-0.60	0.21-0.23	3.0-5.9	2.0-4.0	.37	.37	5	7	38
	6-11	1-10	45-70	27-45	1.20-1.30	0.06-0.20	0.11-0.20	6.0-8.9	2.0-3.5	.37	.37			
	11-24	1-10	45-65	35-50	1.30-1.50	0.00-0.06	0.10-0.20	6.0-8.9	1.0-3.0	.28	.28			
	24-47	1-10	45-65	40-50	1.40-1.60	0.00-0.06	0.10-0.20	6.0-8.9	0.5-1.5	.28	.28			
	47-60	1-10	45-65	40-50	1.40-1.60	0.00-0.06	0.10-0.20	6.0-8.9	0.3-0.7	.28	.28			
091EB: Eudora-----	0-13	10-50	50-80	5-18	1.30-1.50	0.60-2.00	0.20-0.24	0.0-2.9	1.0-2.0	.32	.32	5	5	56
	13-60	10-50	40-75	5-18	1.35-1.50	0.60-2.00	0.17-0.22	0.0-2.9	0.1-0.3	.43	.43			
091MC: Morrill-----	0-13	20-45	15-52	15-29	1.30-1.40	0.60-2.00	0.14-0.21	0.0-2.9	2.0-4.0	.32	.32	5	6	48
	13-22	20-50	15-52	25-35	1.35-1.45	0.20-0.60	0.15-0.19	3.0-5.9	0.5-1.0	.28	.32			
	22-60	20-50	15-50	10-29	1.40-1.55	0.20-2.00	0.15-0.18	3.0-5.9	0.2-0.8	.37	.43			
139CM: Clareson-----	0-8	1-10	50-70	27-40	1.25-1.35	0.20-0.60	0.16-0.22	3.0-5.9	2.5-4.0	.32	.32	2	7	38
	8-16	1-10	50-70	27-40	1.30-1.40	0.20-0.60	0.09-0.21	3.0-5.9	2.0-3.0	.24	.43			
	16-24	1-10	40-60	35-50	1.35-1.45	0.06-0.33	0.04-0.07	6.0-8.9	1.0-3.0	.24	.64			
	24-32													
Eram-----	0-9	1-20	50-70	27-40	1.30-1.60	0.20-0.60	0.15-0.20	3.0-5.9	1.0-3.0	.37	.37	3	7	38
	9-28	1-25	30-60	35-55	1.35-1.65	0.06-0.20	0.10-0.18	6.0-8.9	0.5-1.5	.37	.37			
	28-32													
139ED: Elmont-----	0-8	15-52	28-50	15-27	1.30-1.40	0.60-2.00	0.22-0.24	1.5-4.5	2.0-4.0	.32	.32	5	6	48
	8-16	15-52	28-50	15-27	1.30-1.40	0.60-2.00	0.22-0.24	1.5-4.5	2.0-4.0	.32	.32			
	16-42	15-45	30-60	27-35	1.30-1.45	0.20-0.60	0.18-0.20	3.0-5.9	0.5-2.0	.43	.43			
	42-52	15-45	30-60	27-42	1.40-1.55	0.20-0.60	0.14-0.20	3.0-5.9	0.2-0.8	.43	.43			
	52-60													
139LU: Lula-----	0-8	1-10	50-75	18-27	1.20-1.40	0.60-2.00	0.16-0.20	1.5-4.5	1.0-3.0	.37	.37	3	6	48
	8-14	1-25	40-70	25-35	1.30-1.50	0.60-2.00	0.16-0.20	3.0-5.9	1.0-2.0	.37	.37			
	14-44	1-25	45-65	27-40	1.30-1.50	0.60-2.00	0.16-0.20	3.0-5.9	0.2-0.6	.37	.37			
	44-52													
177MF: Martin-----	0-12	1-10	50-70	27-40	1.35-1.40	0.20-0.60	0.21-0.23	3.0-5.9	2.0-4.0	.37	.37	5	7	38
	12-17	1-10	50-70	27-40	1.35-1.40	0.20-0.60	0.18-0.20	3.0-5.9	1.0-3.0	.37	.37			
	17-60	1-10	30-60	40-55	1.40-1.50	0.06-0.20	0.12-0.18	6.0-8.9	0.5-1.5	.37	.37			
177SW: Stony Steep Land-----	---													
Vinland-----	0-11			27-35	1.20-1.40	0.60-2.00	0.21-0.24	3.0-5.9	2.0-4.0	.32	.32	2	7	38
	11-17			18-35	1.30-1.60	0.60-2.00	0.15-0.22	3.0-5.9	0.5-1.0	.43	.49			
	17-20													
601KW: Konawa-----	0-19	52-75	10-40	10-18	1.30-1.60	2.00-6.00	0.11-0.15	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	19-47	20-45	20-50	20-35	1.35-1.65	0.60-2.00	0.12-0.20	3.0-5.9	0.2-0.8	.32	.32			
	47-60	20-45	20-50	18-32	1.35-1.65	0.60-2.00	0.11-0.17	3.0-5.9	0.1-0.2	.32	.32			
601SA: Sarpy-----	0-9	75-95	1-20	2-5	1.20-1.50	5.95-19.98	0.05-0.09	0.0-2.9	0.1-1.0	.17	.17	5	2	134
	9-60	75-95	1-20	2-5	1.20-1.50	5.95-19.98	0.05-0.09	0.0-2.9	0.1-0.5	.15	.15			
Haynie-----	0-8	30-70	20-40	15-20	1.20-1.35	0.60-2.00	0.18-0.23	0.0-2.9	1.0-2.0	.37	.37	5	3	86
	8-60	30-70	20-55	15-18	1.20-1.35	0.60-2.00	0.15-0.20	0.0-2.9	0.1-0.5	.37	.37			
2326: Kenoma-----	0-4	1-15	50-75	18-27	1.25-1.40	0.20-0.60	0.22-0.24	1.5-4.5	2.0-4.0	.43	.43	4	6	48
	4-10	1-15	50-75	24-35	1.30-1.45	0.20-0.60	0.22-0.24	3.0-5.9	1.5-2.5	.43	.43			
	10-18	1-10	30-60	40-60	1.40-1.50	0.00-0.06	0.10-0.15	6.0-8.9	1.0-2.5	.32	.32			
	18-27	1-10	30-60	40-60	1.40-1.50	0.00-0.06	0.10-0.15	6.0-8.9	0.7-2.0	.32	.32			
	27-41	1-10	30-60	40-60	1.40-1.50	0.00-0.06	0.10-0.15	6.0-8.9	0.4-1.0	.32	.32			
	41-59	1-10	30-60	40-60	1.40-1.50	0.00-0.06	0.10-0.15	6.0-8.9	0.2-0.9	.32	.32			
	59-73	1-10	40-60	30-50	1.35-1.45	0.06-0.20	0.18-0.20	6.0-8.9	0.2-0.4	.32	.32			
2540: Leanna-----	0-10	1-10	50-75	15-27	1.25-1.35	0.60-2.00	0.22-0.24	0.0-2.9	2.0-4.0	.32	.32	3	6	48
	10-22	1-10	50-70	18-35	1.25-1.35	0.20-0.60	0.18-0.24	3.0-5.9	1.0-3.0	.32	.32			
	22-40	1-10	35-65	35-50	1.35-1.50	0.00-0.06	0.11-0.18	6.0-8.9	0.7-2.0	.37	.37			
	40-55	1-10	45-65	27-45	1.35-1.45	0.06-0.20	0.11-0.20	6.0-8.9	0.5-1.5	.37	.37			
	55-78	1-10	45-65	27-45	1.35-1.45	0.06-0.20	0.11-0.20	6.0-8.9	0.2-0.4	.37	.37			

PHYSICAL PROPERTIES OF THE SOILS--Continued  
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Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
2797: Morrill, stony-----	In	Pct	Pct	Pct	g/cc	in/hr	In/in	Pct	Pct					
	0-10	25-50	30-50	22-27	1.30-1.40	0.60-2.00	0.18-0.22	0.0-2.9	2.0-4.0	.20	.24	5	8	0
	10-15	20-50	20-50	25-32	1.30-1.40	0.60-2.00	0.20-0.22	0.0-2.9	1.0-2.0	.32	.37			
	15-42	20-50	20-50	27-35	1.35-1.45	0.20-0.60	0.15-0.19	3.0-5.9	0.5-1.0	.32	.37			
	42-60	20-60	15-50	20-30	1.35-1.50	0.60-2.00	0.10-0.13	0.0-2.9	0.2-0.8	.24	.43			
3460: Sibleyville--	0-7	30-55	20-50	14-27	1.30-1.40	0.60-2.00	0.18-0.21	0.0-2.9	1.0-4.0	.28	.28	4	6	48
	7-15	25-52	20-50	20-35	1.35-1.45	0.60-2.00	0.16-0.19	0.0-2.9	1.0-2.0	.28	.32			
	15-27	25-60	15-50	14-29	1.35-1.50	0.60-2.00	0.12-0.15	0.0-2.9	0.5-1.0	.20	.32			
	27-31	---	---	---	---	---	---	---	---	---	---			
Vinland-----	0-7	10-40	30-55	10-27	1.20-1.40	0.60-2.00	0.21-0.24	0.0-2.9	2.0-4.0	.28	.28	2	6	48
	7-10	5-30	40-60	27-35	1.30-1.60	0.60-2.00	0.15-0.22	0.0-2.9	0.5-1.0	.43	.49			
	10-17	5-30	40-60	15-35	1.30-1.60	0.60-2.00	0.15-0.22	0.0-2.9	0.1-0.3	.43	.49			
	17-21	---	---	---	---	---	---	---	---	---	---			
3461: Sibleyville, eroded-----	0-5	30-55	20-50	14-27	1.30-1.40	0.60-2.00	0.18-0.21	0.0-2.9	1.0-4.0	.28	.28	4	6	48
	5-12	25-52	20-50	20-35	1.35-1.45	0.60-2.00	0.16-0.19	0.0-2.9	1.0-2.0	.28	.32			
	12-27	25-60	15-50	14-29	1.35-1.50	0.60-2.00	0.12-0.15	0.0-2.9	0.5-1.0	.20	.32			
	27-31	---	---	---	---	---	---	---	---	---	---			
3462: Sibleyville--	0-7	30-55	20-50	14-27	1.30-1.40	0.60-2.00	0.18-0.21	0.0-2.9	1.0-4.0	.28	.28	4	6	48
	7-15	25-52	20-50	20-35	1.35-1.45	0.60-2.00	0.16-0.19	0.0-2.9	1.0-2.0	.28	.32			
	15-27	25-60	15-50	14-29	1.35-1.50	0.60-2.00	0.12-0.15	0.0-2.9	0.5-1.0	.20	.32			
	27-31	---	---	---	---	---	---	---	---	---	---			
3464: Sibleyville--	0-7	42	38	14-27	1.30-1.40	0.60-2.00	0.18-0.21	0.0-2.9	1.0-4.0	.28	.28	4	6	48
	7-15	37	35	20-35	1.35-1.45	0.60-2.00	0.16-0.19	0.0-2.9	1.0-2.0	.28	.32			
	15-27	41	37	14-29	1.35-1.50	0.60-2.00	0.12-0.15	0.0-2.9	0.5-1.0	.20	.32			
	27-32	---	---	---	---	---	---	---	---	---	---			
Vinland-----	0-7	43	38	15-30	1.20-1.40	0.60-2.00	0.21-0.24	0.0-2.9	2.0-4.0	.28	.28	2	6	48
	7-10	---	---	15-30	1.30-1.60	0.60-2.00	0.15-0.22	0.0-2.9	0.5-1.0	.43	.49			
	10-17	---	---	15-30	1.30-1.60	0.60-2.00	0.15-0.22	0.0-2.9	0.5-1.0	.43	.49			
	17-30	---	---	---	---	---	---	---	---	---	---			
3494: Summit-----	0-9	1-15	50-65	27-45	1.25-1.50	0.20-0.60	0.14-0.22	3.0-5.9	2.0-4.0	.37	.37	5	4	86
	9-17	1-10	35-60	32-50	1.35-1.65	0.06-0.20	0.14-0.18	6.0-8.9	2.0-4.0	.37	.37			
	17-24	1-10	35-60	40-60	1.35-1.60	0.06-0.20	0.14-0.18	6.0-8.9	1.5-2.5	.32	.32			
	24-41	1-10	35-60	40-60	1.35-1.60	0.06-0.20	0.14-0.18	6.0-8.9	0.5-1.5	.32	.32			
	41-61	1-10	35-60	40-60	1.35-1.60	0.06-0.20	0.14-0.18	6.0-8.9	0.3-0.9	.32	.32			
	61-73	1-10	35-60	35-55	1.35-1.60	0.06-0.20	0.14-0.18	6.0-8.9	0.1-0.3	.32	.32			
3495: Summit-----	0-9	1-15	50-65	27-45	1.25-1.50	0.20-0.60	0.16-0.20	3.0-5.9	2.0-4.0	.37	.37	5	4	86
	9-17	1-15	35-60	32-50	1.35-1.65	0.20-0.60	0.10-0.18	6.0-8.9	2.0-4.0	.37	.37			
	17-24	1-15	35-60	40-60	1.35-1.60	0.06-0.20	0.10-0.18	6.0-8.9	1.5-2.5	.32	.32			
	24-41	1-15	35-60	40-60	1.35-1.60	0.06-0.20	0.10-0.18	6.0-8.9	0.5-1.5	.32	.32			
	41-61	1-15	35-60	40-60	1.35-1.60	0.06-0.20	0.10-0.18	6.0-8.9	0.3-0.9	.32	.32			
	61-73	1-15	35-60	35-55	1.35-1.60	0.06-0.20	0.10-0.18	6.0-8.9	0.1-0.3	.32	.32			
3815: Verdigris----	0-9	1-20	50-75	15-30	1.30-1.40	0.60-2.00	0.20-0.24	1.5-4.5	2.0-4.0	.32	.32	5	6	48
	9-27	1-20	50-75	15-30	1.30-1.40	0.60-2.00	0.17-0.22	3.0-5.9	2.0-4.0	.32	.32			
	27-32	1-20	45-70	15-30	1.40-1.60	0.60-2.00	0.17-0.22	3.0-5.9	2.0-4.0	.32	.32			
	32-52	1-20	45-70	15-30	1.40-1.65	0.60-2.00	0.17-0.22	3.0-5.9	1.0-3.0	.32	.32			
	52-60	1-20	45-70	15-30	1.40-1.65	0.60-2.00	0.17-0.22	3.0-5.9	0.1-1.0	.32	.32			
3926: Water (less Than 40-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---
3951: Woodson-----	0-10	1-10	50-75	18-27	1.25-1.45	0.20-0.60	0.22-0.24	1.5-4.5	2.0-4.0	.43	.43	4	6	48
	10-21	1-10	35-60	40-60	1.30-1.45	0.00-0.06	0.12-0.15	6.0-8.9	1.5-3.5	.32	.32			
	21-30	1-10	35-60	40-60	1.35-1.45	0.00-0.06	0.12-0.15	6.0-8.9	1.0-3.0	.32	.32			
	30-48	1-10	35-60	40-60	1.35-1.45	0.00-0.06	0.10-0.15	6.0-8.9	0.5-1.5	.32	.32			
	48-60	1-10	35-60	35-60	1.35-1.45	0.06-0.20	0.10-0.15	6.0-8.9	0.2-0.6	.32	.32			
AED: Arents, Earthen Dam- Be:	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Basehor-----	0-12	40-60	10-50	8-22	1.30-1.45	2.00-6.00	0.17-0.21	0.0-2.9	0.5-1.0	.32	.32	1	5	56
	12-16	---	---	---	---	---	---	---	---	---	---			
BOP: Borrow Pits-- Et:	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Eudora-----	0-12	10-50	50-80	5-18	1.30-1.50	0.60-2.00	0.20-0.24	0.0-2.9	1.0-2.0	.32	.32	5	5	56
	12-72	10-75	40-75	5-18	1.35-1.50	0.60-2.00	0.17-0.22	0.0-2.9	0.1-0.3	.43	.43			
Ev: Eudora-----	0-12	1-20	50-80	5-18	1.30-1.50	0.60-2.00	0.20-0.24	0.0-2.9	1.0-4.0	.32	.32	5	5	56
	12-72	1-55	40-75	5-18	1.35-1.50	0.60-2.00	0.17-0.22	0.0-2.9	0.1-2.0	.43	.43			
	0-6	1-10	40-60	35-40	1.20-1.30	0.06-0.20	0.13-0.22	6.0-8.9	2.0-4.0	.37	.37	5	4	86
	6-28	1-10	40-60	35-50	1.20-1.30	0.06-0.20	0.13-0.22	6.0-8.9	0.5-1.5	.37	.37			
	28-60	10-70	25-85	7-18	1.30-1.40	0.60-2.00	0.17-0.22	0.0-2.9	0.2-0.8	.37	.37			



PHYSICAL PROPERTIES OF THE SOILS--Continued  
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Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
Ew:	In	Pct	Pct	Pct	g/cc	in/hr	In/in	Pct	Pct					
Eudora-----	0-12	50-75	10-30	5-15	1.35-1.50	2.00-6.00	0.16-0.18	0.0-2.9	1.0-4.0	.20	.20	5	3	86
	12-72	1-55	40-75	5-18	1.35-1.50	0.60-2.00	0.17-0.22	0.0-2.9	0.0-2.0	.43	.43			
Kimo-----	0-15	55-75	10-30	12-20	1.40-1.50	0.60-2.00	0.16-0.18	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	15-28	1-20	40-60	35-50	1.20-1.30	0.06-0.20	0.13-0.22	6.0-8.9	1.0-3.0	.37	.37			
	28-60	20-70	10-70	7-18	1.30-1.40	0.60-2.00	0.17-0.22	0.0-2.9	0.1-0.5	.37	.37			
Gm:														
Gymer-----	0-15	1-20	50-75	20-27	1.30-1.40	0.60-2.00	0.22-0.24	1.5-4.5	2.0-4.0	.32	.32	5	6	48
	15-30	1-20	50-70	35-42	1.40-1.50	0.20-0.60	0.12-0.20	3.0-5.9	1.0-3.0	.43	.43			
	30-80	1-20	50-70	27-35	1.30-1.40	0.60-2.00	0.18-0.20	3.0-5.9	0.1-0.9	.43	.43			
Gy:														
Gymer-----	0-15	1-20	50-75	20-27	1.30-1.40	0.60-2.00	0.22-0.24	1.5-4.5	2.0-4.0	.32	.32	5	6	48
	15-34	1-20	50-70	35-42	1.40-1.50	0.20-0.60	0.12-0.20	3.0-5.9	1.0-2.0	.43	.43			
	34-68	1-20	50-70	27-35	1.30-1.40	0.60-2.00	0.18-0.20	3.0-5.9	0.5-1.0	.43	.43			
Ju:														
Judson-----	0-21	1-20	50-75	24-27	1.30-1.35	0.60-2.00	0.21-0.23	1.5-4.5	2.0-3.0	.28	.28	5	6	48
	21-47	1-20	50-70	30-35	1.35-1.45	0.60-2.00	0.21-0.23	3.0-5.9	1.5-2.5	.43	.43			
	47-60	1-20	50-75	25-32	1.35-1.45	0.60-2.00	0.21-0.23	3.0-5.9	0.3-0.8	.43	.43			
KA:														
Kennebec-----	0-45	1-20	50-75	22-27	1.25-1.35	0.60-2.00	0.22-0.24	3.0-5.9	2.0-4.0	.28	.28	5	6	48
	45-72	1-20	50-70	24-28	1.35-1.40	0.60-2.00	0.20-0.22	3.0-5.9	1.0-2.0	.43	.43			
Kb:														
Kennebec-----	0-48	1-10	50-75	22-27	1.25-1.35	0.60-2.00	0.22-0.24	3.0-5.9	2.0-6.0	.28	.28	5	6	48
	48-60	1-10	50-75	24-28	1.35-1.40	0.60-2.00	0.20-0.22	3.0-5.9	0.5-2.0	.43	.43			
Kc:														
Kennebec-----	0-10	1-10	50-75	27-30	1.25-1.35	0.60-2.00	0.22-0.24	3.0-5.9	2.0-6.0	.28	.28	5	7	38
	10-60	1-10	50-70	24-32	1.35-1.40	0.60-2.00	0.20-0.22	3.0-5.9	0.5-2.0	.43	.43			
Km:														
Kimo-----	0-6	1-20	50-70	35-40	1.20-1.30	0.06-0.20	0.13-0.22	6.0-8.9	2.0-4.0	.37	.37	5	4	86
	6-28	1-20	40-60	35-50	1.20-1.30	0.06-0.20	0.13-0.22	6.0-8.9	0.5-1.5	.37	.37			
	28-60	20-75	25-75	7-18	1.30-1.40	0.60-2.00	0.17-0.22	0.0-2.9	0.2-0.8	.37	.37			
Le:														
Leanna-----	0-22	1-10	50-75	15-27	1.25-1.35	0.20-0.60	0.22-0.24	1.5-4.5	1.0-4.0	.37	.37	3	6	48
	22-40	1-10	35-60	35-50	1.35-1.50	0.00-0.06	0.11-0.18	6.0-8.9	1.0-3.0	.37	.37			
	40-78	1-10	40-65	27-45	1.35-1.45	0.06-0.20	0.11-0.20	6.0-8.9	0.5-1.5	.37	.37			
M-W:														
Miscellaneous	---			---	---	---	---	---	---	---	---	-	---	---
Water-----														
Mb:														
Martin-----	0-9	1-10	50-70	27-40	1.35-1.40	0.20-0.60	0.21-0.23	3.0-5.9	2.0-4.0	.37	.37	5	7	38
	9-14	1-10	50-70	27-40	1.35-1.40	0.20-0.60	0.18-0.20	3.0-5.9	1.0-3.0	.37	.37			
	14-60	1-10	30-60	40-55	1.40-1.50	0.06-0.20	0.12-0.18	6.0-8.9	0.5-1.5	.37	.37			
Mc:														
Martin-----	0-9	1-10	50-70	27-40	1.35-1.40	0.20-0.60	0.21-0.23	3.0-5.9	2.0-4.0	.37	.37	5	7	38
	9-14	1-10	50-70	27-40	1.35-1.40	0.20-0.60	0.18-0.20	3.0-5.9	1.0-3.0	.37	.37			
	14-60	1-10	30-60	40-55	1.40-1.50	0.06-0.20	0.12-0.18	6.0-8.9	0.5-1.5	.37	.37			
Mh:														
Martin, eroded-----	0-9	1-10	50-70	27-40	1.35-1.40	0.20-0.60	0.21-0.23	3.0-5.9	1.5-3.5	.37	.37	5	7	38
	9-14	1-10	50-70	27-40	1.35-1.40	0.20-0.60	0.18-0.20	3.0-5.9	1.5-3.5	.37	.37			
	14-60	1-10	30-60	40-55	1.40-1.50	0.06-0.20	0.12-0.18	6.0-8.9	0.5-1.5	.37	.37			
Mo:														
Martin-----	0-9	1-10	50-70	27-40	1.35-1.40	0.20-0.60	0.21-0.23	3.0-5.9	2.0-4.0	.37	.37	5	7	38
	9-14	1-10	50-70	27-40	1.35-1.40	0.20-0.60	0.18-0.20	3.0-5.9	1.0-3.0	.37	.37			
	14-60	1-10	30-60	40-55	1.40-1.50	0.06-0.20	0.12-0.18	6.0-8.9	0.5-1.5	.37	.37			
Oska-----	0-5	1-10	50-75	27-40	1.30-1.40	0.20-0.60	0.18-0.20	3.0-5.9	2.0-3.0	.37	.37	2	7	38
	5-38	1-10	30-60	35-60	1.35-1.45	0.06-0.20	0.14-0.18	6.0-8.9	0.5-2.0	.37	.37			
	38-42			---	---	---	---	---	---	---	---			
Mr:														
Morrill-----	0-10	20-45	15-52	15-30	1.30-1.40	0.60-2.00	0.14-0.21	0.0-2.9	2.0-4.0	.28	.28	5	6	48
	10-56	20-50	15-52	25-35	1.35-1.45	0.20-0.60	0.15-0.19	3.0-5.9	0.5-1.0	.28	.28			
	56-66	20-50	15-50	10-29	1.40-1.55	0.20-2.00	0.15-0.18	3.0-5.9	0.2-0.8	.37	.37			
Ms:														
Morrill-----	0-10	20-45	15-52	15-30	1.30-1.40	0.60-2.00	0.14-0.21	0.0-2.9	1.0-4.0	.28	.28	5	6	48
	10-56	20-50	15-52	25-35	1.35-1.45	0.20-0.60	0.15-0.19	3.0-5.9	0.5-1.0	.28	.28			
	56-66	20-50	15-50	10-29	1.40-1.55	0.20-2.00	0.15-0.18	3.0-5.9	0.2-0.8	.37	.37			
Oe:														
Oska-----	0-5	1-10	50-75	27-40	1.30-1.40	0.20-0.60	0.18-0.20	3.0-5.9	2.0-3.0	.37	.37	2	7	38
	5-38	1-10	30-60	35-60	1.35-1.45	0.06-0.20	0.14-0.18	6.0-8.9	0.5-2.0	.37	.37			
	38-42			---	---	---	---	---	---	---	---			
Pb:														
Pawnee-----	0-14	20-45	20-50	30-38	1.40-1.50	0.20-0.60	0.17-0.19	3.0-5.9	2.0-4.0	.37	.37	5	6	48
	14-34	20-40	20-40	40-50	1.50-1.70	0.06-0.20	0.09-0.11	6.0-8.9	0.5-1.5	.37	.37			
	34-72	20-55	20-40	25-35	1.40-1.50	0.06-0.20	0.14-0.16	6.0-8.9	0.1-0.5	.37	.37			
Pc:														
Pawnee-----	0-14	20-45	20-50	30-38	1.40-1.50	0.20-0.60	0.17-0.19	3.0-5.9	2.0-4.0	.37	.37	5	6	48
	14-34	20-40	20-40	40-50	1.50-1.70	0.06-0.20	0.09-0.11	6.0-8.9	0.5-1.5	.37	.37			
	34-72	20-55	20-40	25-35	1.40-1.50	0.06-0.20	0.14-0.16	6.0-8.9	0.1-0.5	.37	.37			
Ph:														
Pawnee, eroded-----	0-14	20-45	20-50	30-38	1.40-1.50	0.20-0.60	0.17-0.19	3.0-5.9	2.0-4.0	.37	.37	5	6	48
	14-34	20-40	20-40	40-50	1.50-1.70	0.06-0.20	0.09-0.11	6.0-8.9	0.5-1.5	.37	.37			
	34-72	20-55	20-40	25-35	1.40-1.50	0.06-0.20	0.14-0.16	6.0-8.9	0.1-0.5	.37	.37			

PHYSICAL PROPERTIES OF THE SOILS--Continued  
Douglas County, Kansas: Published

(Single entries under "Sand and Silt" are a representative percentage are calculated using an algorithm. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer)

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
QUA: Quarries-----	---	---	---	---	---	---	---	---	---	---	---	---	---	0
Re: Reading-----	0-15 15-41 41-60	1-10 1-10 1-30	50-75 45-70 40-60	18-27 27-35 30-45	1.35-1.40 1.40-1.50 1.40-1.50	0.60-2.00 0.20-2.00 0.20-2.00	0.22-0.24 0.18-0.20 0.13-0.20	1.5-4.5 3.0-5.9 3.0-5.9	2.0-4.0 0.5-3.0 0.5-1.0	.32 .43 .43	.32 .43 .43	5	6	48
Ro: River Wash----	---	---	---	---	---	---	---	---	---	---	---	---	---	0
Sa: Sand Pit-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Sb: Sarpy-----	0-12 12-60	70-95 70-95	1-10 1-10	2-5 2-5	1.20-1.50 1.20-1.50	5.95-19.98 5.95-19.98	0.05-0.09 0.05-0.09	0.0-2.9 0.0-2.9	0.2-1.0 0.1-0.5	.17 .15	.17 .15	5	2	134
Eudora-----	0-8 8-60	55-75 10-75	10-40 40-75	5-15 5-18	1.35-1.50 1.35-1.50	2.00-6.00 0.60-2.00	0.16-0.18 0.17-0.22	0.0-2.9 0.0-2.9	0.5-1.0 0.1-2.0	.20 .43	.20 .43	5	3	86
Sc: Sharpsburg---	0-12 12-27 27-36 36-60	1-10 1-10 1-10 1-10	50-75 40-65 30-38 50-70	25-27 36-42 30-38 25-32	1.30-1.35 1.35-1.40 1.40-1.45 1.40-1.45	0.60-2.00 0.20-0.60 0.60-2.00 0.60-2.00	0.21-0.23 0.18-0.20 0.18-0.20 0.18-0.20	3.0-5.9 6.0-8.9 6.0-8.9 3.0-5.9	2.0-4.0 1.0-2.0 0.5-1.0 0.1-0.8	.32 .43 .43 .43	.32 .43 .43 .43	5	6	48
Sd: Sharpsburg---	0-12 12-27 27-36 36-60	1-10 1-10 1-10 1-10	50-75 40-65 30-38 50-70	25-27 36-42 30-38 25-32	1.30-1.35 1.35-1.40 1.40-1.45 1.40-1.45	0.60-2.00 0.20-0.60 0.60-2.00 0.60-2.00	0.21-0.23 0.18-0.20 0.18-0.20 0.18-0.20	3.0-5.9 6.0-8.9 6.0-8.9 3.0-5.9	2.0-4.0 1.0-2.0 0.5-1.0 0.1-0.8	.32 .43 .43 .43	.32 .43 .43 .43	5	6	48
Sh: Sibleyville--	0-7 7-15 15-27 27-31	30-55 25-52 25-60	20-50 20-50 15-50	14-27 20-35 14-29	1.30-1.40 1.35-1.45 1.35-1.50	0.60-2.00 0.60-2.00 0.60-2.00	0.18-0.21 0.16-0.19 0.12-0.15	0.0-2.9 0.0-2.9 0.0-2.9	1.0-4.0 1.0-2.0 0.5-1.0	.28 .28 .20	.28 .28 .20	3	6	48
So: Sibleyville, eroded-----	0-5 5-12 12-27 27-31	30-55 25-52 25-60	20-50 20-50 15-50	14-27 20-35 14-29	1.30-1.40 1.35-1.45 1.35-1.50	0.60-2.00 0.60-2.00 0.60-2.00	0.18-0.21 0.16-0.19 0.12-0.15	0.0-2.9 0.0-2.9 0.0-2.9	1.0-4.0 1.0-2.0 0.5-1.0	.28 .28 .20	.28 .32 .32	4	6	48
Ss: Sibleyville--	0-7 7-15 15-27 27-31	30-55 25-52 25-60	20-50 20-50 15-50	14-27 20-35 14-29	1.30-1.40 1.35-1.45 1.35-1.50	0.60-2.00 0.60-2.00 0.60-2.00	0.18-0.21 0.16-0.19 0.12-0.15	0.0-2.9 0.0-2.9 0.0-2.9	1.0-4.0 1.0-2.0 0.5-1.0	.28 .28 .20	.28 .28 .20	3	6	48
St: Sibleyville, eroded-----	0-7 7-15 15-27 27-31	30-55 25-52 25-60	20-50 20-50 15-50	14-27 20-35 14-29	1.30-1.40 1.35-1.45 1.35-1.50	0.60-2.00 0.60-2.00 0.60-2.00	0.18-0.21 0.16-0.19 0.12-0.15	0.0-2.9 0.0-2.9 0.0-2.9	1.0-4.0 1.0-2.0 0.5-1.0	.28 .28 .20	.28 .28 .20	3	6	48
SU: Summit-----	0-8 8-13 13-60	5-15 5-15 1-10	50-65 30-65 30-60	27-45 32-45 40-60	1.25-1.50 1.35-1.65 1.35-1.60	0.20-0.60 0.20-0.60 0.06-0.20	0.16-0.20 0.10-0.18 0.10-0.18	3.0-5.9 6.0-8.9 6.0-8.9	2.0-4.0 1.5-3.5 0.5-1.5	.37 .37 .32	.37 .37 .32	5	4	86
Sv: Sibleyville--	0-7 7-15 15-27 27-31	30-55 25-52 25-60	20-50 20-50 15-50	14-27 20-35 14-29	1.30-1.40 1.35-1.45 1.35-1.50	0.60-2.00 0.60-2.00 0.60-2.00	0.18-0.21 0.16-0.19 0.12-0.15	0.0-2.9 0.0-2.9 0.0-2.9	1.0-4.0 1.0-2.0 0.5-1.0	.28 .28 .20	.28 .28 .20	3	6	48
SVV: Sibleyville--	0-8 8-22 22-29 29-33	30-55 25-52 25-60	20-50 20-50 15-50	14-27 20-35 14-29	1.30-1.40 1.35-1.45 1.35-1.50	0.60-2.00 0.60-2.00 0.60-2.00	0.18-0.21 0.16-0.19 0.12-0.15	0.0-2.9 0.0-2.9 0.0-2.9	1.0-4.0 1.0-2.0 0.5-1.0	.32 .32 .20	.32 .32 .32	3	6	48
Vinland-----	0-18 18-22	1-20	40-75	10-35	1.20-1.40	0.60-2.00	0.21-0.24	0.0-2.9	2.0-4.0	.28	.28	2	6	48
Sw: Sogn-----	0-12 12-16	1-20	50-70	27-35	1.15-1.20	0.60-2.00	0.17-0.22	3.0-5.9	1.0-3.0	.32	.32	1	4L	86
Vinland-----	0-7 7-17 17-21	1-20 1-55	50-75 20-70	27-35 18-35	1.20-1.40 1.30-1.60	0.60-2.00 0.60-2.00	0.21-0.24 0.15-0.22	3.0-5.9 3.0-5.9	2.0-4.0 0.5-1.0	.32 .43	.32 .43	2	7	38
Sx: Rock Outcrop- Vinland-----	0-5 0-7 7-17 17-21	1-20 1-55	50-75 20-70	27-35 18-35	1.20-1.40 1.30-1.60	0.60-2.00 0.60-2.00	0.21-0.24 0.15-0.22	3.0-5.9 3.0-5.9	2.0-4.0 0.5-1.0	.32 .43	.32 .43	2	7	38
Tc: Thurman-----	0-22 22-32 32-60	70-90 70-90 85-95	1-20 1-10 1-10	5-12 5-12 2-7	1.60-1.70 1.60-1.70 1.60-1.70	5.95-19.98 5.95-19.98 5.95-19.98	0.10-0.12 0.08-0.10 0.05-0.07	0.0-2.9 0.0-2.9 0.0-2.9	1.0-2.0 0.3-0.7 0.1-0.5	.17 .17 .15	.17 .17 .15	5	2	134
VA: Verdigris----	0-7 7-60	1-10 1-10	50-75 50-70	15-27 18-35	1.30-1.40 1.40-1.65	0.60-2.00 0.60-2.00	0.20-0.24 0.17-0.22	1.0-4.5 3.0-5.9	2.0-4.0 1.0-2.0	.32 .32	.32 .32	5	6	48

PHYSICAL PROPERTIES OF THE SOILS--Continued  
Douglas County, Kansas: Published

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(Single entries under "Sand and Silt" are a representative percentage are calculated using an algorithm. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer)

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
Vc: Vinland-----	In	Pct	Pct	Pct	g/cc	in/hr	In/in	Pct	Pct					
	0-12	1-20	50-75	27-35	1.20-1.40	0.60-2.00	0.21-0.24	3.0-5.9	2.0-4.0	.32	.32	2	7	38
	12-16	1-55	20-70	18-35	1.30-1.60	0.60-2.00	0.15-0.22	3.0-5.9	0.5-1.0	.43	.49			
	16-20													
Vh: Vinland-----	0-7	1-20	50-75	27-35	1.20-1.40	0.60-2.00	0.21-0.24	3.0-5.9	2.0-4.0	.32	.32	2	7	38
	7-17	1-55	20-70	18-35	1.30-1.60	0.60-2.00	0.15-0.22	3.0-5.9	0.5-1.0	.43	.43			
	17-21													
Vm: Vinland-----	0-7	1-20	50-75	27-35	1.20-1.40	0.60-2.00	0.21-0.24	3.0-5.9	2.0-4.0	.32	.32	2	7	38
	7-17	1-55	20-70	18-35	1.30-1.60	0.60-2.00	0.15-0.22	3.0-5.9	0.5-1.0	.43	.43			
	17-21													
Martin-----	0-9	1-10	50-70	27-40	1.35-1.40	0.20-0.60	0.21-0.23	3.0-5.9	2.0-4.0	.37	.37	5	7	38
	9-14	1-10	50-70	27-40	1.35-1.40	0.20-0.60	0.18-0.20	3.0-5.9	1.0-3.0	.37	.37			
	14-60	1-10	30-60	40-55	1.40-1.50	0.06-0.20	0.12-0.18	6.0-8.9	0.5-1.5	.37	.37			
W: Water (< 40 Acres)-----	---			---	---	---	---	---	---	---	---	-	---	---
Wc: Wabash-----	0-16	1-10	50-70	27-35	1.35-1.50	0.06-0.20	0.21-0.24	6.0-8.9	2.5-4.0	.28	.28	5	7	38
	16-70	1-10	30-60	40-60	1.20-1.45	0.00-0.06	0.08-0.12	9.0-25.0	0.5-2.0	.28	.28			
Wh: Wabash-----	0-16	1-10	40-60	40-50	1.25-1.45	0.00-0.06	0.12-0.14	9.0-25.0	2.5-4.0	.28	.28	5	4	86
	16-70	1-10	30-60	40-60	1.20-1.45	0.00-0.06	0.08-0.12	9.0-25.0	0.5-2.0	.28	.28			
Wo: Woodson-----	0-11	1-10	50-75	18-27	1.25-1.45	0.20-0.60	0.22-0.24	0.0-2.9	2.0-4.0	.43	.43	4	6	48
	11-45	1-10	30-60	40-60	1.30-1.45	0.00-0.06	0.12-0.15	6.0-8.9	0.5-2.0	.32	.32			
	45-78	1-10	30-60	30-50	1.35-1.45	0.06-0.20	0.10-0.15	6.0-8.9	0.2-0.8	.32	.32			
Ws: Woodson-----	0-11	1-10	50-75	18-27	1.25-1.45	0.20-0.60	0.22-0.24	0.0-2.9	2.0-4.0	.43	.43	4	6	48
	11-45	1-10	30-60	40-60	1.30-1.45	0.00-0.06	0.12-0.15	6.0-8.9	0.5-2.0	.32	.32			
	45-78	1-10	30-60	30-50	1.35-1.45	0.06-0.20	0.10-0.15	6.0-8.9	0.2-0.8	.32	.32			
Wx: Woodson, eroded-----	0-8	1-10	50-70	27-32	1.25-1.45	0.20-0.60	0.21-0.23	3.0-5.9	2.0-4.0	.37	.37	4	7	38
	8-45	1-10	30-60	40-60	1.30-1.45	0.00-0.06	0.12-0.15	6.0-8.9	0.5-2.0	.32	.32			
	45-78	1-10	30-60	30-50	1.35-1.45	0.06-0.20	0.10-0.15	6.0-8.9	0.2-0.8	.32	.32			

CHEMICAL PROPERTIES OF THE SOILS  
Douglas County, Kansas

The Chemical Properties table shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils. Depth to the upper and lower boundaries of each layer is indicated.

Cation-exchange capacity is the total amount of extractable bases that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. Soils having a high cation-exchange capacity can retain cations. The ability to retain cations helps to prevent the pollution of ground water.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

Gypsum is expressed as a percent, by weight, of hydrated calcium sulfates in the fraction of the soil less than 20 millimeters in size. Gypsum is partially soluble in water and can be dissolved and removed by water. Soils that have a high content of gypsum may collapse if the gypsum is removed by percolating water.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Sodium adsorption ratio (SAR) is a measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration. Soils that have SAR values of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced permeability and aeration, and a general degradation of soil structure.

CHEMICAL PROPERTIES OF THE SOILS--Continued  
Douglas County, Kansas

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Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100g	pH	Pct	Pct	mmhos/cm	
059BC:							
Bates-----	0-19	6.0-19	5.1-6.5	0	0	0	0
	19-34	7.0-21	5.1-6.5	0	0	0	0
	34-38	7.0-18	5.1-6.5	0	0	0	0
	38-42	---	---	---	---	---	---
059BD:							
Bates-----	0-19	6.0-19	5.1-6.5	0	0	0	0
	19-34	7.0-21	5.1-6.5	0	0	0	0
	34-38	7.0-18	5.1-6.5	0	0	0	0
	38-42	---	---	---	---	---	---
Collinsville----	0-11	3.0-14	4.5-6.5	0	0	0	0
	11-17	2.0-12	4.5-6.5	0	0	0	0
	17-21	---	---	---	---	---	---
059BH:							
Bates-----	0-19	6.0-19	5.1-6.5	0	0	0	0
	19-26	7.0-21	5.1-6.5	0	0	0	0
	26-34	7.0-18	5.1-6.5	0	0	0	0
	34-38	---	---	---	---	---	---
Collinsville----	0-11	3.0-14	4.5-6.5	0	0	0	0
	11-17	2.0-12	4.5-6.5	0	0	0	0
	17-21	---	---	---	---	---	---
059BS:							
Bolivar-----	0-13	6.0-18	5.1-6.0	0	0	0	0
	13-28	---	4.5-6.0	0	0	0	0
	28-34	---	4.5-6.0	0	0	0	0
	34-38	---	---	---	---	---	---
Hector-----	0-9	2.0-13	5.1-6.5	0	0	0	0
	9-18	---	4.5-5.5	0	0	0	0
	18-22	---	---	---	---	---	---
059CM:							
Clareson-----	0-7	6.0-21	5.6-7.3	0	0	0	0
	7-15	10-24	5.6-7.3	0	0	0	0
	15-26	14-30	5.6-7.3	0	0	0	0
	26-30	---	---	---	---	---	---
Eram-----	0-7	11-26	5.6-6.5	0	0	0	0
	7-38	14-33	5.1-7.3	0	0	0	0
	38-42	---	---	---	---	---	---
059DN:							
Dennis-----	0-10	4.0-18	5.1-6.0	0	0	0	0
	10-15	8.0-18	5.1-6.0	0	0	0	0
	15-60	14-33	5.1-8.4	0	0	0	0
Bates-----	0-19	6.0-19	5.1-6.5	0	0	0	0
	19-26	7.0-21	5.1-6.5	0	0	0	0
	26-34	7.0-18	5.1-6.5	0	0	0	0
	34-38	---	---	---	---	---	---
059EA:							
Eram-----	0-7	11-26	5.6-6.5	0	0	0	0
	7-38	14-33	5.1-7.3	0	0	0	0
	38-42	---	---	---	---	---	---
Lebo-----	0-14	9.0-23	5.6-7.8	0	0	0	0
	14-28	8.0-21	5.6-7.8	0	0	0	0
	28-36	---	---	---	---	---	---
059EC:							
Eram-----	0-7	11-26	5.6-6.5	0	0	0	0
	7-38	14-33	5.1-7.3	0	0	0	0
	38-42	---	---	---	---	---	---
Lula-----	0-7	6.0-18	5.6-6.5	0	0	0	0
	7-12	7.0-21	5.6-6.5	0	0	0	0
	12-44	15-30	5.6-7.8	0	0	0	0
	44-52	---	---	---	---	---	---
059LN:							
Lebo-----	0-7	9.0-23	5.6-7.8	0	0	0	0
	7-14	8.0-21	5.6-7.8	0	0	0	0
	14-28	8.0-21	5.6-7.8	0	0	0	0
	28-36	---	---	---	---	---	---
Rock Outcrop----	---	---	---	---	---	---	---
059MB:							
Mason-----	0-7	5.0-18	5.1-7.3	0	0	0	0
	7-60	8.0-21	4.5-7.8	0	0	0	0

CHEMICAL PROPERTIES OF THE SOILS--Continued  
Douglas County, Kansas

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Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100g	pH	Pct	Pct	mmhos/cm	
059OS:							
Osage-----	0-14	14-27	5.1-7.3	0	0	0	0
	14-60	14-36	5.6-7.8	0	0	0	0
059VB:							
Verdigris-----	0-16	6.0-19	5.6-7.3	0	0	0	0
	16-60	7.0-21	5.6-7.3	0	0	0	0
087EC:							
Eudora-----	0-6	5.0-20	6.1-7.3	0	0	0	0
	6-12	5.0-15	6.6-7.3	0	0	0	0
	12-18	5.0-15	6.6-7.3	0	0	0	0
	18-25	5.0-15	6.6-7.8	0	0	0	0
	25-44	5.0-15	6.6-8.4	0	0	0	0
	44-60	5.0-15	6.6-8.4	0	0	0	0
Bismarckgrove---	0-7	5.0-20	6.1-7.3	0	0	0	0
	7-33	10-25	6.1-7.8	0	0	0	0
	33-52	10-15	6.6-7.8	0	0	0	0
	52-80	0.0-5.0	6.6-7.8	0-5	0	0	0
087FU:							
Fluvaquents-----	0-7	---	6.6-7.8	0-15	0	0	0
	7-35	---	7.4-8.4	0-15	0	0	0
	35-60	---	7.4-8.4	0-15	0	0	0
087MU:							
Muscotah-----	0-6	20-35	5.7-6.2	0	0	0	0
	6-11	20-45	6.2-6.7	0	0	0	0
	11-24	25-45	6.5-6.9	0	0	0	0
	24-47	30-45	7.0-7.0	0-2	0	0	0
	47-60	30-45	7.2-7.5	0-2	0	0	0
091EB:							
Eudora-----	0-13	2.0-13	6.1-7.8	0	0	0	0
	13-60	2.0-12	6.6-8.4	0	0	0	0
091MC:							
Morrill-----	0-13	6.0-20	5.1-7.3	0	0	0	0
	13-22	10-21	5.1-7.3	0	0	0	0
	22-60	4.0-18	5.1-7.3	0	0	0	0
139CM:							
Clareson-----	0-8	6.0-21	5.6-7.3	0	0	0	0
	8-16	10-24	5.6-7.3	0	0	0	0
	16-24	14-30	5.6-7.3	0	0	0	0
	24-32	---	---	---	---	---	---
Eram-----	0-9	11-26	5.6-6.5	0	0	0	0
	9-28	14-33	5.1-7.3	0	0	0	0
	28-32	---	---	---	---	---	---
139ED:							
Elmont-----	0-8	6.0-19	5.1-7.3	0	0	0	0
	8-16	6.0-19	5.1-7.3	0	0	0	0
	16-42	10-21	5.1-7.3	0	0	0	0
	42-52	10-25	5.1-7.3	0	0	0	0
	52-60	---	---	---	---	---	---
139LU:							
Lula-----	0-8	10-20	5.6-6.5	0	0	0	0
	8-14	12-28	5.6-6.5	0	0	0	0
	14-44	15-30	5.6-7.8	0	0	0	0
	44-52	---	---	---	---	---	---
177MF:							
Martin-----	0-12	11-27	5.6-6.5	0	0	0	0
	12-17	10-24	5.6-7.3	0	0	0	0
	17-60	16-33	5.6-7.8	0-1	0	0	0
177SW:							
Stony Steep Land	---	---	---	---	---	---	---
Vinland-----	0-11	11-24	5.6-7.8	0	0	0	0
	11-17	6.0-22	5.6-7.8	0	0	0	0
	17-20	---	---	---	---	---	---
601KW:							
Konawa-----	0-19	4.0-11	5.6-7.3	0	0	0	0
	19-47	---	4.5-6.0	0	0	0	0
	47-60	---	4.5-6.0	0	0	0	0
601SA:							
Sarpy-----	0-9	0.0-4.0	6.6-8.4	0	0	0	0
	9-60	0.0-3.0	6.6-8.4	0	0	0	0
	0-8	6.0-14	6.6-8.4	0-25	0	0	0
Haynie-----	8-60	6.0-11	7.4-8.4	5-30	0	0	0

CHEMICAL PROPERTIES OF THE SOILS--Continued  
Douglas County, Kansas

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Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100g	pH	Pct	Pct	mmhos/cm	
2326:							
Kenoma-----	0-4	10-25	5.1-6.5	0	0	0.0-2.0	0
	4-10	10-25	5.1-6.5	0	0	0.0-2.0	0
	10-18	20-40	5.1-7.8	0	0	0.0-2.0	0
	18-27	20-40	5.1-7.8	0	0	0.0-2.0	0
	27-41	15-30	6.1-8.4	0	0	0.0-2.0	0
	41-59	15-30	6.1-8.4	0	0	0.0-2.0	0
	59-73	15-30	6.1-8.4	0	0	0.0-4.0	0
2540:							
Leanna-----	0-10	10-25	5.1-6.5	0	0	0	0
	10-22	10-30	5.1-6.5	0	0	0	0
	22-40	15-35	5.1-7.3	0	0	0	0
	40-55	10-30	5.6-7.3	0	0	0	0
	55-78	10-30	5.6-7.3	0	0	0	0
2797:							
Morrill, stony--	0-10	10-15	5.1-7.3	0	0	0.0-2.0	0
	10-15	10-15	5.1-7.3	0	0	0.0-2.0	0
	15-42	10-15	5.1-7.3	0	0	0.0-2.0	0
	42-60	5.0-10	5.1-7.3	0	0	0.0-2.0	0
3460:							
Sibleyville-----	0-7	10-25	5.6-7.3	0	0	0	0
	7-15	10-25	5.1-7.3	0	0	0	0
	15-27	5.0-20	5.1-7.3	0	0	0	0
	27-31	---	---	---	---	---	---
Vinland-----	0-7	10-25	5.6-7.8	0	0	0	0
	7-10	5.0-20	5.6-7.8	0	0	0	0
	10-17	5.0-20	5.6-7.8	0	0	0	0
	17-21	---	---	---	---	---	---
3461:							
Sibleyville, eroded-----	0-5	10-25	5.6-7.3	0	0	0	0
	5-12	10-25	5.1-7.3	0	0	0	0
	12-27	5.0-20	5.1-7.3	0	0	0	0
	27-31	---	---	---	---	---	---
3462:							
Sibleyville-----	0-7	10-25	5.6-7.3	0	0	0	0
	7-15	10-25	5.1-7.3	0	0	0	0
	15-27	5.0-20	5.1-7.3	0	0	0	0
	27-31	---	---	---	---	---	---
3464:							
Sibleyville-----	0-7	10-25	5.6-7.3	0	0	0	0
	7-15	10-25	5.1-7.3	0	0	0	0
	15-27	5.0-20	5.1-7.3	0	0	0	0
	27-32	---	---	---	---	---	---
Vinland-----	0-7	10-25	5.6-7.8	0	0	0	0
	7-10	5.0-20	5.6-7.8	0	0	0	0
	10-17	5.0-20	5.6-7.8	0	0	0	0
	17-30	---	---	---	---	---	---
3494:							
Summit-----	0-9	20-50	5.6-7.3	0	0	0	0
	9-17	20-50	5.6-7.3	0	0	0	0
	17-24	25-55	5.6-8.4	0	0	0	0
	24-41	25-55	5.6-8.4	0	0	0	0
	41-61	25-55	6.6-8.4	0	0	0	0
	61-73	20-50	6.6-8.4	0	0	0	0
3495:							
Summit-----	0-9	20-50	5.6-7.3	0	0	0	0
	9-17	20-50	5.6-7.3	0	0	0	0
	17-24	25-55	5.6-8.4	0	0	0	0
	24-41	25-55	6.6-8.4	0	0	0	0
	41-61	25-55	6.6-8.4	0	0	0	0
	61-73	20-50	6.6-8.4	0	0	0	0
3815:							
Verdigris-----	0-9	20-35	5.6-7.3	0	0	0	0
	9-27	20-35	5.6-7.3	0	0	0	0
	27-32	20-35	5.6-7.3	0	0	0	0
	32-52	15-20	5.6-7.3	0	0	0	0
	52-60	10-15	5.6-7.3	0	0	0	0
3926:							
Water (less Than 40-----	---	---	---	---	---	---	---

CHEMICAL PROPERTIES OF THE SOILS--Continued  
Douglas County, Kansas

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Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100g	pH	Pct	Pct	mmhos/cm	
3951:							
Woodson-----	0-10	20-30	5.6-6.5	0	0	0	0
	10-21	20-30	5.6-7.3	0	0	0	0
	21-30	20-30	5.6-7.3	0	0	0	0
	30-48	15-25	5.6-7.3	0	0	0	0
	48-60	5.0-15	5.6-7.8	0	0	0	0
AED:							
Arents, Earthen	---	---	---	---	---	---	---
Dam-----							
Be:							
Basehor-----	0-12	3.0-14	5.1-6.5	0	0	0	0
	12-16	---	---	---	---	---	---
BOP:							
Borrow Pits----	---	---	---	---	---	---	---
Et:							
Eudora-----	0-12	2.0-13	6.1-7.8	0	0	0	0
	12-72	2.0-12	6.6-8.4	0	0	0	0
Ev:							
Eudora-----	0-12	2.0-13	6.1-7.8	0	0	0	0
	12-72	2.0-12	6.6-8.4	---	0	0	0
	0-6	14-27	6.1-8.4	0	0	0	0
Kimo-----	6-28	14-30	6.1-8.4	0	0	0	0
	28-60	2.0-11	6.1-8.4	0	0	0	0
Ew:							
Eudora-----	0-12	2.0-12	6.1-7.8	---	---	---	---
	12-72	2.0-12	6.6-8.4	---	0	0	0
Kimo-----	0-15	4.0-13	6.1-8.4	0	0	0	0
	15-28	14-30	6.1-8.4	0	0	0	0
	28-60	2.0-11	6.1-8.4	0	0	0	0
Gm:							
Gymer-----	0-15	8.0-19	5.1-6.5	0	0	0	0
	15-30	14-25	5.6-6.5	0	0	0	0
	30-80	10-21	5.6-6.5	0	0	0	0
Gy:							
Gymer-----	0-15	8.0-19	5.1-6.5	0	0	0	0
	15-34	14-25	5.6-6.5	0	0	0	0
	34-68	10-21	5.6-6.5	0	0	0	0
Ju:							
Judson-----	0-21	11-19	5.6-7.3	0	0	0	0
	21-47	12-21	5.6-7.3	0	0	0	0
	47-60	10-19	6.1-7.8	0	0	0	0
KA:							
Kennebec-----	0-45	10-20	5.6-7.3	0	0	0	0
	45-72	10-18	6.1-7.3	0	0	0	0
Kb:							
Kennebec-----	0-48	10-20	5.6-7.3	0	0	0	0
	48-60	10-18	6.1-7.3	0	0	0	0
Kc:							
Kennebec-----	0-10	12-22	5.6-7.3	0	0	0	0
	10-60	10-18	6.1-7.3	0	0	0	0
Km:							
Kimo-----	0-6	14-27	6.1-8.4	---	---	---	---
	6-28	14-30	6.1-8.4	---	---	---	---
	28-60	2.0-11	6.1-8.4	---	---	---	---
Le:							
Leanna-----	0-22	6.0-19	5.1-6.5	0	0	0	0
	22-40	14-30	5.1-7.3	0	0	0	0
	40-78	10-27	5.6-7.3	0	0	0	0
M-W:							
Miscellaneous	---	---	---	---	---	---	---
Water-----							
Mb:							
Martin-----	0-9	11-27	5.6-6.5	0	0	0	0
	9-14	10-24	5.6-7.3	0	0	0	0
	14-60	16-33	5.6-7.8	0-1	0	0	0
Mc:							
Martin-----	0-9	11-27	5.6-6.5	0	0	0	0
	9-14	10-24	5.6-7.3	0	0	0	0
	14-60	16-33	5.6-7.8	0-1	0	0	0



CHEMICAL PROPERTIES OF THE SOILS--Continued  
Douglas County, Kansas

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Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100g	pH	Pct	Pct	mmhos/cm	
Mh:							
Martin, eroded--	0-9	11-27	5.6-6.5	0	0	0	0
	9-14	10-24	5.6-7.3	0	0	0	0
	14-60	16-33	5.6-7.8	0	0	0	0
Mo:							
Martin-----	0-9	11-27	5.6-6.5	0	0	0	0
	9-14	10-24	5.6-7.3	0	0	0	0
	14-60	16-33	5.6-7.8	0-1	0	0	0
Oska-----	0-5	11-26	5.6-6.5	0	0	0	0
	5-38	14-36	5.6-7.8	0	0	0	0
	38-42	---	---	---	---	---	---
Mr:							
Morrill-----	0-10	6.0-20	5.1-7.3	0	0	0	0
	10-56	10-21	5.1-7.3	0	0	0	0
	56-66	4.0-18	5.1-7.3	0	0	0	0
Ms:							
Morrill-----	0-10	6.0-20	5.1-7.3	0	0	0	0
	10-56	10-21	5.1-7.3	0	0	0	0
	56-66	4.0-18	5.1-7.3	0	0	0	0
Oe:							
Oska-----	0-5	11-26	5.6-6.5	0	0	0	0
	5-38	14-36	5.6-7.8	0	0	0	0
	38-42	---	---	---	---	---	---
Pb:							
Pawnee-----	0-14	13-25	5.6-7.3	0	0	0	0
	14-34	16-30	6.1-8.4	0	0	0	0
	34-72	10-21	7.4-8.4	0-5	0	0	0
Pc:							
Pawnee-----	0-14	13-25	5.6-7.3	0	0	0	0
	14-34	16-30	6.1-8.4	0	0	0	0
	34-72	10-21	7.4-8.4	0-5	0	0	0
Ph:							
Pawnee, eroded--	0-14	13-25	5.6-7.3	0	0	0	0
	14-34	16-30	6.1-8.4	0	0	0	0
	34-72	10-21	7.4-8.4	0-5	0	0	0
QUA:							
Quarries-----	---	---	---	---	---	---	---
Re:							
Reading-----	0-15	8.0-19	5.6-6.5	0	0	0	0
	15-41	11-23	5.6-6.5	0	0	0	0
	41-60	12-26	6.1-8.4	0	0	0	0
Ro:							
River Wash-----	---	---	---	---	---	---	---
Sa:							
Sand Pit-----	---	---	---	---	---	---	---
Sb:							
Sarpy-----	0-12	0.0-4.0	6.6-8.4	0	0	0	0
	12-60	0.0-3.0	6.6-8.4	0	0	0	0
Eudora-----	0-8	2.0-12	6.1-7.8	0	0	0	0
	8-60	2.0-11	6.6-8.4	0	0	0	0
Sc:							
Sharpsburg-----	0-12	11-19	5.1-7.3	0	0	0	0
	12-27	14-27	5.1-6.0	0	0	0	0
	27-36	12-24	5.1-6.5	0	0	0	0
	36-60	10-20	6.1-6.5	0	0	0	0
Sd:							
Sharpsburg-----	0-12	11-19	5.1-7.3	0	0	0	0
	12-27	14-27	5.1-6.0	0	0	0	0
	27-36	12-24	5.1-6.5	0	0	0	0
	36-60	10-20	6.1-6.5	0	0	0	0
Sh:							
Sibleyville-----	0-7	6.0-19	5.6-7.3	0	0	0	0
	7-15	8.0-22	5.1-7.3	0	0	0	0
	15-27	5.0-18	5.1-7.3	0	0	0	0
	27-31	---	---	---	---	---	---
So:							
Sibleyville, eroded-----	0-5	10-25	5.6-7.3	0	0	0	0
	5-12	10-25	5.1-7.3	0	0	0	0
	12-27	5.0-20	5.1-7.3	0	0	0	0
	27-31	---	---	---	---	---	---

CHEMICAL PROPERTIES OF THE SOILS--Continued  
Douglas County, Kansas

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Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100g	pH	Pct	Pct	mmhos/cm	
Ss:							
Sibleyville-----	0-7	6.0-19	5.6-7.3	0	0	0	0
	7-15	8.0-22	5.1-7.3	0	0	0	0
	15-27	5.0-18	5.1-7.3	0	0	0	0
	27-31	---	---	---	---	---	---
St:							
Sibleyville, eroded-----	0-7	6.0-19	5.6-7.3	0	0	0	0
	7-15	8.0-22	5.1-7.3	0	0	0	0
	15-27	5.0-18	5.1-7.3	0	0	0	0
	27-31	---	---	---	---	---	---
SU:							
Summit-----	0-8	11-30	5.6-7.3	0	0	0	0
	8-13	13-28	5.6-7.3	0	0	0	0
	13-60	16-37	5.6-8.4	0	0	0	0
Sv:							
Sibleyville-----	0-7	6.0-19	5.6-7.3	0	0	0	0
	7-15	8.0-22	5.1-7.3	0	0	0	0
	15-27	5.0-18	5.1-7.3	0	0	0	0
	27-31	---	---	---	---	---	---
SVV:							
Sibleyville-----	0-8	6.0-19	5.6-7.3	0	0	0	0
	8-22	8.0-22	5.1-7.3	0	0	0	0
	22-29	5.0-18	5.1-7.3	0	0	0	0
	29-33	---	---	---	---	---	---
Vinland-----	0-18	4.0-19	5.6-7.8	0	0	0	0
	18-22	---	---	---	---	---	---
Sw:							
Sogn-----	0-12	11-23	6.1-8.4	0	0	0	0
	12-16	---	---	---	---	---	---
Vinland-----	0-7	11-24	5.6-7.8	0	0	0	0
	7-17	6.0-22	5.6-7.8	0	0	0	0
	17-21	---	---	---	---	---	---
Sx:							
Rock Outcrop----	0-5	---	---	---	---	---	---
Vinland-----	0-7	11-24	5.6-7.8	0	0	0	0
	7-17	6.0-22	5.6-7.8	0	0	0	0
	17-21	---	---	---	---	---	---
Tc:							
Thurman-----	0-22	2.0-8.0	5.6-7.3	0	0	0	0
	22-32	2.0-8.0	5.6-7.3	0	0	0	0
	32-60	1.0-5.0	5.6-7.3	0	0	0	0
VA:							
Verdigris-----	0-7	6.0-19	5.6-7.3	0	0	0	0
	7-60	7.0-21	5.6-7.3	0	0	0	0
Vc:							
Vinland-----	0-12	11-24	5.6-7.8	0	0	0	0
	12-16	6.0-22	5.6-7.8	0	0	0	0
	16-20	---	---	---	---	---	---
Vh:							
Vinland-----	0-7	11-24	5.6-7.8	0	0	0	0
	7-17	6.0-22	5.6-7.8	0	0	0	0
	17-21	---	---	---	---	---	---
Vm:							
Vinland-----	0-7	11-24	5.6-7.8	0	0	0	0
	7-17	6.0-22	5.6-7.8	0	0	0	0
	17-21	---	---	---	---	---	---
Martin-----	0-9	11-27	5.6-6.5	0	0	0	0
	9-14	10-24	5.6-7.3	0	0	0	0
	14-60	16-33	5.6-7.8	0-1	0	0	0
W:							
Water (< 40 Acres)-----	---	---	---	---	---	---	---
Wc:							
Wabash-----	0-16	11-24	5.6-7.3	0	0	0	0
	16-70	16-36	5.6-7.8	0	0	0	0
Wh:							
Wabash-----	0-16	16-30	5.6-7.3	0	0	0	0
	16-70	16-36	5.6-7.8	0	0	0	0

CHEMICAL PROPERTIES OF THE SOILS--Continued  
Douglas County, Kansas

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Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100g	pH	Pct	Pct	mmhos/cm	
Wo:							
Woodson-----	0-11	7.0-19	5.6-6.5	0	0	0	0
	11-45	16-36	5.6-7.3	0	0	0	0
	45-78	12-30	5.6-7.8	0	0	0	0
Ws:							
Woodson-----	0-11	7.0-19	5.6-6.5	0	0	0	0
	11-45	16-36	5.6-7.3	0	0	0	0
	45-78	12-30	5.6-7.8	0	0	0	0
Wx:							
Woodson, eroded-	0-8	11-22	5.6-6.5	0	0	0	0
	8-45	16-36	5.6-7.3	0	0	0	0
	45-78	12-30	5.6-7.8	0	0	0	0

# WATER FEATURES Douglas County, Kansas

The Water Features table gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations. Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

The months in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. The Water Features table indicates, by month, depth to the top (upper limit) and base (lower limit) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table. Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The Water Features table indicates surface water depth and the duration and frequency of ponding. Duration is expressed as very brief if less than 2 days, brief if 2 to 7 days, long if 7 to 30 days, and very long if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. None means that ponding is not probable; rare that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); occasional that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and frequent that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and frequency are estimated. Duration is expressed as extremely brief if 0.1 hour to 4 hours, very brief if 4 hours to 2 days, brief if 2 to 7 days, long if 7 to 30 days, and very long if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. None means that flooding is not probable; very rare that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); rare that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); occasional that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); frequent that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and very frequent that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydro- logic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
059BC: Bates-----	B		---	---	---	---	---	---	---
059BD: Bates-----	B		---	---	---	---	---	---	---
Collinsville-----	D		---	---	---	---	---	---	---
059BH: Bates-----	B		---	---	---	---	---	---	---
Collinsville-----	D		---	---	---	---	---	---	---
059BS: Bolivar-----	B		---	---	---	---	---	---	---
Hector-----	D		---	---	---	---	---	---	---
059CM: Clareson-----	C		---	---	---	---	---	---	---
Eram-----	C		---	---	---	---	---	---	---
059DN: Dennis-----	C	February	0.8-1.2	1.8-2.2	---	---	---	---	None
		March	0.8-1.2	1.8-2.2	---	---	---	---	None
		April	0.8-1.2	1.8-2.2	---	---	---	---	None
	C	January	1.0-1.5	2.0-3.0	---	---	---	---	None
		February	1.0-1.5	2.0-3.0	---	---	---	---	None
		March	1.0-1.5	2.0-3.0	---	---	---	---	None
		April	1.0-1.5	2.0-3.0	---	---	---	---	None
		December	1.0-1.5	2.0-3.0	---	---	---	---	None
	B		---	---	---	---	---	---	---
059EA: Eram-----	C		---	---	---	---	---	---	---
Lebo-----	B	February	0.8-1.2	1.8-2.2	---	---	---	---	None
		March	0.8-1.2	1.8-2.2	---	---	---	---	None
		April	0.8-1.2	1.8-2.2	---	---	---	---	None
059EC: Eram-----	C		---	---	---	---	---	---	---
Lula-----	B	February	0.8-1.2	1.8-2.2	---	---	---	---	None
		March	0.8-1.2	1.8-2.2	---	---	---	---	None
		April	0.8-1.2	1.8-2.2	---	---	---	---	None
059LN: Lebo-----	B		---	---	---	---	---	---	---
Rock Outcrop-----	D		---	---	---	---	---	---	---
059MB: Mason-----	B		---	---	---	---	---	---	---
059OS: Osage-----	D	January	---	---	---	---	---	---	Rare
		February	---	---	---	---	---	---	Rare
		March	---	---	---	---	---	---	Rare
		April	---	---	---	---	---	---	Rare
		May	---	---	---	---	---	---	Rare
		June	---	---	---	---	---	---	Rare
		July	---	---	---	---	---	---	Rare
		August	---	---	---	---	---	---	Rare
		September	---	---	---	---	---	---	Rare
		October	---	---	---	---	---	---	Rare
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	Rare
									---
		January	0.0-1.0	>6.0	---	---	---	---	Rare
		February	0.0-1.0	>6.0	---	---	---	---	Rare
		March	0.0-1.0	>6.0	---	---	---	Very brief	Occasional
		April	0.0-1.0	>6.0	---	---	---	Very brief	Occasional
		May	0.0-1.0	>6.0	---	---	---	Very brief	Occasional
		June	---	---	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
		September	---	---	---	---	---	Very brief	Occasional
		October	---	---	---	---	---	Very brief	Occasional
		November	0.0-1.0	>6.0	---	---	---	---	Rare
		December	0.0-1.0	>6.0	---	---	---	---	Rare
059VB:									

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydro- logic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Verdigris-----	B	January	---	---	---	---	---	---	Rare
		February	---	---	---	---	---	---	Rare
		March	---	---	---	---	---	Brief	Occasional
		April	---	---	---	---	---	Brief	Occasional
		May	---	---	---	---	---	Brief	Occasional
		June	---	---	---	---	---	Brief	Occasional
		July	---	---	---	---	---	Brief	Occasional
		August	---	---	---	---	---	Brief	Occasional
		September	---	---	---	---	---	Brief	Occasional
		October	---	---	---	---	---	Brief	Occasional
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	Rare
087EC: Eudora-----	B	January	---	---	---	---	---	---	Rare
		February	---	---	---	---	---	---	Rare
		March	---	---	---	---	---	Brief	Occasional
		April	---	---	---	---	---	Brief	Occasional
		May	---	---	---	---	---	Brief	Occasional
		June	---	---	---	---	---	---	Rare
		July	---	---	---	---	---	---	Rare
		August	---	---	---	---	---	---	Rare
		September	---	---	---	---	---	---	Rare
		October	---	---	---	---	---	---	Rare
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	Rare
Bismarckgrove-----	B	January	---	---	---	---	---	---	Rare
		February	---	---	---	---	---	---	Rare
		March	---	---	---	---	---	Brief	Occasional
		April	---	---	---	---	---	Brief	Occasional
		May	---	---	---	---	---	Brief	Occasional
		June	---	---	---	---	---	---	Rare
		July	---	---	---	---	---	---	Rare
		August	---	---	---	---	---	---	Rare
		September	---	---	---	---	---	---	Rare
		October	---	---	---	---	---	---	Rare
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	Rare
087FU: Fluvaquents-----	B	January	1.5-3.0	>6.0	---	---	---	---	Rare
		February	1.5-3.0	>6.0	---	---	---	---	Rare
		March	1.5-3.0	>6.0	---	---	---	Long	Frequent
		April	1.5-3.0	>6.0	---	---	---	Long	Frequent
		May	1.5-3.0	>6.0	---	---	---	Long	Frequent
		June	1.5-3.0	>6.0	---	---	---	Long	Frequent
		July	---	---	---	---	---	---	Rare
		August	---	---	---	---	---	---	Rare
		September	---	---	---	---	---	---	Rare
		October	---	---	---	---	---	---	Rare
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	Rare
087MU: Muscotah-----	D	January	---	---	---	---	---	---	Very rare
		February	---	---	---	---	---	---	Very rare
		March	1.5-3.0	>6.0	---	---	---	---	Very rare
		April	1.5-3.0	>6.0	---	---	---	---	Very rare
		May	1.5-3.0	>6.0	---	---	---	---	Very rare
		June	1.5-3.0	>6.0	---	---	---	---	Very rare
		July	---	---	---	---	---	---	Very rare
		August	---	---	---	---	---	---	Very rare
		September	---	---	---	---	---	---	Very rare
		October	---	---	---	---	---	---	Very rare
		November	---	---	---	---	---	---	Very rare
		December	---	---	---	---	---	---	Very rare
091EB: Eudora-----	B	January	---	---	---	---	---	---	Rare
		February	---	---	---	---	---	---	Rare
		March	---	---	---	---	---	---	Rare
		April	---	---	---	---	---	---	Rare
		May	---	---	---	---	---	---	Rare
		June	---	---	---	---	---	---	Rare
		July	---	---	---	---	---	---	Rare
		August	---	---	---	---	---	---	Rare
		September	---	---	---	---	---	---	Rare
		October	---	---	---	---	---	---	Rare
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	Rare
091MC:			---	---	---	---	---	---	---

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydro- logic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Morrill-----	B		Ft	Ft	Ft				
139CM: Clareson-----	C		---	---	---	---	---	---	---
Eram-----	C		---	---	---	---	---	---	---
139ED: Elmont-----	B	February	0.8-1.2	1.8-2.2	---	---	---	---	None
		March	0.8-1.2	1.8-2.2	---	---	---	---	None
		April	0.8-1.2	1.8-2.2	---	---	---	---	None
139LU: Lula-----	C		---	---	---	---	---	---	---
177MF: Martin-----	C	February	1.8-2.2	2.8-3.2	---	---	---	---	None
		March	1.8-2.2	2.8-3.2	---	---	---	---	None
		April	1.8-2.2	2.8-3.2	---	---	---	---	None
177SW: Stony Steep Land-----	---		---	---	---	---	---	---	---
Vinland-----	D		---	---	---	---	---	---	---
601KW: Konawa-----	B		---	---	---	---	---	---	---
601SA: Sarpy-----	A	January	---	---	---	---	---	Long	Occasional
		February	---	---	---	---	---	Long	Occasional
		March	---	---	---	---	---	Long	Occasional
		April	---	---	---	---	---	Long	Occasional
		May	---	---	---	---	---	Long	Occasional
		June	---	---	---	---	---	Long	Occasional
		November	---	---	---	---	---	Long	Occasional
		December	---	---	---	---	---	Long	Occasional
Haynie-----	B	February	---	---	---	---	---	Very brief	Occasional
		March	---	---	---	---	---	Very brief	Occasional
		April	---	---	---	---	---	Very brief	Occasional
		May	---	---	---	---	---	Very brief	Occasional
		June	---	---	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
		September	---	---	---	---	---	Very brief	Occasional
		October	---	---	---	---	---	Very brief	Occasional
		November	---	---	---	---	---	Very brief	Occasional
2326: Kenoma-----	D	February	0.8-1.2	2.3-2.7	---	---	---	---	None
		March	0.8-1.2	2.3-2.7	---	---	---	---	None
		April	0.8-1.2	2.3-2.7	---	---	---	---	None
2540: Leanna-----	D	January	0.3-0.7	1.8-2.2	---	---	---	---	Rare
		February	0.3-0.7	1.8-2.2	---	---	---	---	Rare
		March	0.3-0.7	1.8-2.2	---	---	---	Brief	Occasional
		April	0.3-0.7	1.8-2.2	---	---	---	Brief	Occasional
		May	0.3-0.7	1.8-2.2	---	---	---	Brief	Occasional
		June	---	---	---	---	---	Brief	Occasional
		July	---	---	---	---	---	Brief	Occasional
		August	---	---	---	---	---	Brief	Occasional
		September	---	---	---	---	---	Brief	Occasional
		October	---	---	---	---	---	Brief	Occasional
		November	---	---	---	---	---	---	Rare
		December	0.3-0.7	1.8-2.2	---	---	---	---	Rare
2797: Morrill, stony-----	B		---	---	---	---	---	---	---
3460: Sibleyville-----	B		---	---	---	---	---	---	---
Vinland-----	D		---	---	---	---	---	---	---
3461: Sibleyville, eroded-----	B		---	---	---	---	---	---	---
3462: Sibleyville-----	B		---	---	---	---	---	---	---
3464: Sibleyville-----	B		---	---	---	---	---	---	---

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydro- logic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Vinland-----	D		Ft ---	Ft ---	Ft ---	---	---	---	---
3494: Summit-----	C		---	---	---	---	---	---	---
		January	2.0-3.0	2.0-3.0	---	---	---	---	None
		February	2.0-3.0	2.0-3.0	---	---	---	---	None
		March	2.0-3.0	2.0-3.0	---	---	---	---	None
		April	2.0-3.0	2.0-3.0	---	---	---	---	None
		December	2.0-3.0	2.0-3.0	---	---	---	---	None
3495: Summit-----	C								
		February	1.8-2.2	2.8-3.2	---	---	---	---	None
		March	1.8-2.2	2.8-3.2	---	---	---	---	None
		April	1.8-2.2	2.8-3.2	---	---	---	---	None
3815: Verdigris-----	B								
		January	---	---	---	---	---	---	Rare
		February	---	---	---	---	---	---	Rare
		March	---	---	---	---	---	Brief	Frequent
		April	---	---	---	---	---	Brief	Frequent
		May	---	---	---	---	---	Brief	Frequent
		June	---	---	---	---	---	Brief	Frequent
		July	---	---	---	---	---	Brief	Frequent
		August	---	---	---	---	---	Brief	Frequent
		September	---	---	---	---	---	Brief	Frequent
		October	---	---	---	---	---	Brief	Frequent
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	Rare
3926: Water (less Than 40-----	---								
			---	---	---	---	---	---	---
3951: Woodson-----	D								
		January	0.3-0.7	1.8-2.2	---	---	---	---	None
		February	0.3-0.7	1.8-2.2	---	---	---	---	None
		March	0.3-0.7	1.8-2.2	---	---	---	---	None
		April	0.3-0.7	1.8-2.2	---	---	---	---	None
Be: Basehor-----	D								
			---	---	---	---	---	---	---
BOP: Borrow Pits-----	---								
			---	---	---	---	---	---	---
Et: Eudora-----	B								
		January	---	---	---	---	---	---	Rare
		February	---	---	---	---	---	---	Rare
		March	---	---	---	---	---	---	Rare
		April	---	---	---	---	---	---	Rare
		May	---	---	---	---	---	---	Rare
		June	---	---	---	---	---	---	Rare
		July	---	---	---	---	---	---	Rare
		August	---	---	---	---	---	---	Rare
		September	---	---	---	---	---	---	Rare
		October	---	---	---	---	---	---	Rare
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	Rare
Ev: Eudora-----	B								
		January	---	---	---	---	---	---	Rare
		February	---	---	---	---	---	---	Rare
		March	---	---	---	---	---	---	Rare
		April	---	---	---	---	---	---	Rare
		May	---	---	---	---	---	---	Rare
		June	---	---	---	---	---	---	Rare
		July	---	---	---	---	---	---	Rare
		August	---	---	---	---	---	---	Rare
		September	---	---	---	---	---	---	Rare
		October	---	---	---	---	---	---	Rare
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	Rare



(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydro- logic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Kimo-----	C	January	1.8-2.2	>6.0	---	---	---	---	Rare
		February	1.8-2.2	>6.0	---	---	---	---	Rare
		March	1.8-2.2	>6.0	---	---	---	---	Rare
		April	1.8-2.2	>6.0	---	---	---	---	Rare
		May	2.8-3.2	>6.0	---	---	---	---	Rare
		June	---	---	---	---	---	---	Rare
		July	---	---	---	---	---	---	Rare
		August	---	---	---	---	---	---	Rare
		September	---	---	---	---	---	---	Rare
		October	---	---	---	---	---	---	Rare
		November	---	---	---	---	---	---	Rare
		December	2.8-3.2	>6.0	---	---	---	---	Rare
Ew: Eudora-----	B	January	---	---	---	---	---	---	Rare
		February	---	---	---	---	---	---	Rare
		March	---	---	---	---	---	---	Rare
		April	---	---	---	---	---	---	Rare
		May	---	---	---	---	---	---	Rare
		June	---	---	---	---	---	---	Rare
		July	---	---	---	---	---	---	Rare
		August	---	---	---	---	---	---	Rare
		September	---	---	---	---	---	---	Rare
		October	---	---	---	---	---	---	Rare
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	Rare
Kimo-----	C	January	---	---	---	---	---	---	Rare
		February	---	---	---	---	---	---	Rare
		March	2.0-6.0	>6.0	---	---	---	---	Rare
		April	2.0-6.0	>6.0	---	---	---	---	Rare
		May	2.0-6.0	>6.0	---	---	---	---	Rare
		June	2.0-6.0	>6.0	---	---	---	---	Rare
		July	---	---	---	---	---	---	Rare
		August	---	---	---	---	---	---	Rare
		September	---	---	---	---	---	---	Rare
		October	---	---	---	---	---	---	Rare
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	Rare
Gm: Gymer-----	C	January	---	---	---	---	---	---	---
Gy: Gymer-----		February	---	---	---	---	---	---	---
Ju: Judson-----	B	January	---	---	---	---	---	---	Rare
		February	---	---	---	---	---	---	Rare
		March	---	---	---	---	---	---	Rare
		April	---	---	---	---	---	---	Rare
		May	---	---	---	---	---	---	Rare
		June	---	---	---	---	---	---	Rare
		July	---	---	---	---	---	---	Rare
		August	---	---	---	---	---	---	Rare
		September	---	---	---	---	---	---	Rare
		October	---	---	---	---	---	---	Rare
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	Rare
KA: Kennebec-----	B	January	3.0-5.0	>6.0	---	---	---	---	Rare
		February	3.0-5.0	>6.0	---	---	---	---	Rare
		March	3.0-5.0	>6.0	---	---	---	Brief	Frequent
		April	3.0-5.0	>6.0	---	---	---	Brief	Frequent
		May	3.0-5.0	>6.0	---	---	---	Brief	Frequent
		June	3.0-5.0	>6.0	---	---	---	Brief	Frequent
		July	3.0-5.0	>6.0	---	---	---	Brief	Frequent
		August	---	---	---	---	---	Brief	Frequent
		September	---	---	---	---	---	Brief	Frequent
		October	---	---	---	---	---	Brief	Frequent
		November	3.0-5.0	>6.0	---	---	---	---	Rare
		December	3.0-5.0	>6.0	---	---	---	---	Rare
Kb:									

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Map symbol and soil name	Hydro- logic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Kennebec-----	B		Ft	Ft	Ft				
		January	3.3-3.7	>6.0	---	---	---	---	Rare
		February	3.3-3.7	>6.0	---	---	---	---	Rare
		March	3.3-3.7	>6.0	---	---	---	Brief	Occasional
		April	3.3-3.7	>6.0	---	---	---	Brief	Occasional
		May	---	---	---	---	---	Brief	Occasional
		June	---	---	---	---	---	Brief	Occasional
		July	---	---	---	---	---	Brief	Occasional
		August	---	---	---	---	---	Brief	Occasional
		September	---	---	---	---	---	Brief	Occasional
		October	---	---	---	---	---	Brief	Occasional
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	Rare
Kc: Kennebec-----	B								
		January	3.3-3.7	>6.0	---	---	---	---	Rare
		February	3.3-3.7	>6.0	---	---	---	---	Rare
		March	3.3-3.7	>6.0	---	---	---	Brief	Frequent
		April	3.3-3.7	>6.0	---	---	---	Brief	Frequent
		May	---	---	---	---	---	Brief	Frequent
		June	---	---	---	---	---	Brief	Frequent
		July	---	---	---	---	---	Brief	Frequent
		August	---	---	---	---	---	Brief	Frequent
		September	---	---	---	---	---	Brief	Frequent
		October	---	---	---	---	---	Brief	Frequent
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	Rare
Km: Kimo-----	C								
		January	1.8-2.2	>6.0	---	---	---	---	Rare
		February	1.8-2.2	>6.0	---	---	---	---	Rare
		March	1.8-2.2	>6.0	---	---	---	---	Rare
		April	1.8-2.2	>6.0	---	---	---	---	Rare
		May	2.8-3.2	>6.0	---	---	---	---	Rare
		June	---	---	---	---	---	---	Rare
		July	---	---	---	---	---	---	Rare
		August	---	---	---	---	---	---	Rare
		September	---	---	---	---	---	---	Rare
		October	---	---	---	---	---	---	Rare
		November	---	---	---	---	---	---	Rare
		December	2.8-3.2	>6.0	---	---	---	---	Rare
Le: Leanna -----	D								
		January	0.5-2.0	1.0-2.0	---	---	---	---	Rare
		February	0.5-2.0	1.0-2.0	---	---	---	---	Rare
		March	0.5-2.0	1.0-2.0	---	---	---	Brief	Occasional
		April	0.5-2.0	1.0-2.0	---	---	---	Brief	Occasional
		May	0.5-2.0	1.0-2.0	---	---	---	Brief	Occasional
		June	0.5-2.0	1.0-2.0	---	---	---	Brief	Occasional
		July	---	---	---	---	---	Brief	Occasional
		August	---	---	---	---	---	Brief	Occasional
		September	---	---	---	---	---	Brief	Occasional
		October	---	---	---	---	---	Brief	Occasional
		November	---	---	---	---	---	---	Rare
		December	0.5-2.0	1.0-2.0	---	---	---	---	Rare
Mb: Martin-----	C								
		February	1.8-2.2	2.8-3.2	---	---	---	---	None
		March	1.8-2.2	2.8-3.2	---	---	---	---	None
		April	1.8-2.2	2.8-3.2	---	---	---	---	None
Mc: Martin-----	C								
		February	1.8-2.2	2.8-3.2	---	---	---	---	None
		March	1.8-2.2	2.8-3.2	---	---	---	---	None
		April	1.8-2.2	2.8-3.2	---	---	---	---	None
Mh: Martin, eroded-----	C								
			---	---	---	---	---	---	---
Mo: Martin-----	C								
		February	1.8-2.2	2.8-3.2	---	---	---	---	None
		March	1.8-2.2	2.8-3.2	---	---	---	---	None
		April	1.8-2.2	2.8-3.2	---	---	---	---	None
Oska-----	C								
			---	---	---	---	---	---	---
Mr: Morrill-----	B								
			---	---	---	---	---	---	---
Ms: Morrill-----	B								
			---	---	---	---	---	---	---
Oe: Oska-----	C								
			---	---	---	---	---	---	---

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydro- logic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Pb: Pawnee-----	D	February	0.8-1.2	2.8-3.2	---	---	---	---	None
		March	0.8-1.2	2.8-3.2	---	---	---	---	None
		April	0.8-1.2	2.8-3.2	---	---	---	---	None
Pc: Pawnee-----	D	February	0.8-1.2	2.8-3.2	---	---	---	---	None
		March	0.8-1.2	2.8-3.2	---	---	---	---	None
		April	0.8-1.2	2.8-3.2	---	---	---	---	None
Ph: Pawnee, eroded-----	D	February	0.8-1.2	2.8-3.2	---	---	---	---	None
		March	0.8-1.2	2.8-3.2	---	---	---	---	None
		April	0.8-1.2	2.8-3.2	---	---	---	---	None
QUA: Quarries-----	---								
Re: Reading-----	B	January	---	---	---	---	---	---	---
		February	---	---	---	---	---	---	Rare
		March	---	---	---	---	---	---	Rare
		April	---	---	---	---	---	---	Rare
		May	---	---	---	---	---	---	Rare
		June	---	---	---	---	---	---	Rare
		July	---	---	---	---	---	---	Rare
		August	---	---	---	---	---	---	Rare
		September	---	---	---	---	---	---	Rare
		October	---	---	---	---	---	---	Rare
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	---
Ro: River Wash-----	---								
Sa: Sand Pit-----	---								
Sb: Sarpy-----	A	January	---	---	---	---	---	---	Rare
		February	---	---	---	---	---	---	Rare
		March	---	---	---	---	---	Brief	Occasional
		April	---	---	---	---	---	Brief	Occasional
		May	---	---	---	---	---	Brief	Occasional
		June	---	---	---	---	---	---	Rare
		July	---	---	---	---	---	---	Rare
		August	---	---	---	---	---	---	Rare
		September	---	---	---	---	---	---	Rare
		October	---	---	---	---	---	---	Rare
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	Rare
Eudora-----	B	January	---	---	---	---	---	---	Rare
		February	---	---	---	---	---	---	Rare
		March	---	---	---	---	---	Brief	Occasional
		April	---	---	---	---	---	Brief	Occasional
		May	---	---	---	---	---	Brief	Occasional
		June	---	---	---	---	---	---	Rare
		July	---	---	---	---	---	---	Rare
		August	---	---	---	---	---	---	Rare
		September	---	---	---	---	---	---	Rare
		October	---	---	---	---	---	---	Rare
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	Rare
Sc: Sharpsburg-----	B								
Sd: Sharpsburg-----	B								
Sh: Sibleyville-----	B								
So: Sibleyville, eroded-----	B								
Ss: Sibleyville-----	B								
St: Sibleyville, eroded-----	B								

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Map symbol and soil name	Hydro- logic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
SU: Summit-----	C		Ft	Ft	Ft				
		February	1.8-2.2	2.8-3.2	---	---	---	---	None
		March	1.8-2.2	2.8-3.2	---	---	---	---	None
		April	1.8-2.2	2.8-3.2	---	---	---	---	None
Sv: Sibleyville-----	B		---	---	---	---	---	---	---
SVV: Sibleyville-----	B		---	---	---	---	---	---	---
Vinland-----	D		---	---	---	---	---	---	---
Sw: Sogn-----	D		---	---	---	---	---	---	---
Vinland-----	D		---	---	---	---	---	---	---
Sx: Rock Outcrop-----	---		---	---	---	---	---	---	---
Vinland-----	D		---	---	---	---	---	---	---
Tc: Thurman-----	A		---	---	---	---	---	---	---
VA: Verdigris-----	B		---	---	---	---	---	---	---
		January	---	---	---	---	---	---	Rare
		February	---	---	---	---	---	---	Rare
		March	---	---	---	---	---	Very brief	Frequent
		April	---	---	---	---	---	Very brief	Frequent
		May	---	---	---	---	---	Very brief	Frequent
		June	---	---	---	---	---	Very brief	Frequent
		July	---	---	---	---	---	Very brief	Frequent
		August	---	---	---	---	---	Very brief	Frequent
		September	---	---	---	---	---	Very brief	Frequent
		October	---	---	---	---	---	Very brief	Frequent
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	Rare
Vc: Vinland-----	D		---	---	---	---	---	---	---
Vh: Vinland-----	D		---	---	---	---	---	---	---
Vm: Vinland-----	D		---	---	---	---	---	---	---
Martin-----	C		---	---	---	---	---	---	---
		February	1.8-2.2	2.8-3.2	---	---	---	---	None
		March	1.8-2.2	2.8-3.2	---	---	---	---	None
		April	1.8-2.2	2.8-3.2	---	---	---	---	None
W: Water (< 40 Acres)-----	---		---	---	---	---	---	---	---
Wc: Wabash-----	D		---	---	---	---	---	---	---
		January	0.2-0.8	>6.0	---	---	---	---	Rare
		February	0.2-0.8	>6.0	---	---	---	---	Rare
		March	0.2-0.8	>6.0	---	---	---	Brief	Occasional
		April	0.2-0.8	>6.0	---	---	---	Brief	Occasional
		May	0.2-0.8	>6.0	---	---	---	Brief	Occasional
		June	0.8-1.2	>6.0	---	---	---	Brief	Occasional
		July	---	---	---	---	---	Brief	Occasional
		August	---	---	---	---	---	Brief	Occasional
		September	---	---	---	---	---	Brief	Occasional
		October	---	---	---	---	---	Brief	Occasional
		November	0.8-1.2	>6.0	---	---	---	---	Rare
		December	0.8-1.2	>6.0	---	---	---	---	Rare
Wh: Wabash-----	D		---	---	---	---	---	---	---
		January	0.2-0.8	>6.0	---	---	---	---	Rare
		February	0.2-0.8	>6.0	---	---	---	---	Rare
		March	0.2-0.8	>6.0	---	---	---	Brief	Occasional
		April	0.2-0.8	>6.0	---	---	---	Brief	Occasional
		May	0.2-0.8	>6.0	---	---	---	Brief	Occasional
		June	0.8-1.2	>6.0	---	---	---	Brief	Occasional
		July	---	---	---	---	---	Brief	Occasional
		August	---	---	---	---	---	Brief	Occasional
		September	---	---	---	---	---	Brief	Occasional
		October	---	---	---	---	---	Brief	Occasional
		November	0.8-1.2	>6.0	---	---	---	Brief	Occasional
		December	0.8-1.2	>6.0	---	---	---	---	Rare

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Map symbol and soil name	Hydro- logic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
Wo: Woodson-----	D	February	0.3-0.7	1.8-2.2	---	---	---	---	None
		March	0.3-0.7	1.8-2.2	---	---	---	---	None
		April	0.3-0.7	1.8-2.2	---	---	---	---	None
Ws: Woodson-----	D	February	0.3-0.7	1.8-2.2	---	---	---	---	None
		March	0.3-0.7	1.8-2.2	---	---	---	---	None
		April	0.3-0.7	1.8-2.2	---	---	---	---	None
Wx: Woodson, eroded-----	D	February	0.3-0.7	1.8-2.2	---	---	---	---	None
		March	0.3-0.7	1.8-2.2	---	---	---	---	None
		April	0.3-0.7	1.8-2.2	---	---	---	---	None

The following table gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A restrictive layer is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. Depth to top is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as low, moderate, or high, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as low, moderate, or high. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Map symbol and soil name	Restrictive layer				Potential for Frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated Steel	Concrete
059BC: Bates-----	20-40	In Bedrock (paralithic)	---	---	---	Low	Moderate
059BD: Bates-----	20-40	Bedrock (paralithic)	---	Weakly cemented	---	Low	Moderate
Collinsville----	4-20	Bedrock (lithic)	---	Moderately cemented	---	Low	Moderate
059BH: Bates-----	20-40	Bedrock (paralithic)	---	Weakly cemented	---	Low	Moderate
Collinsville----	4-20	Bedrock (lithic)	---	Strongly cemented	---	Low	Moderate
059BS: Bolivar-----	20-40	Bedrock (paralithic)	---	Weakly cemented	---	Low	Moderate
Hector-----	10-20	Bedrock (lithic)	---	Moderately cemented	---	Low	Moderate
059CM: Clareson-----	20-40	Bedrock (lithic)	---	Indurated	---	High	Moderate
Eram-----	20-40	Bedrock (paralithic)	---	Weakly cemented	None	High	Moderate
059DN: Dennis-----	---	---	---	---	---	High	Moderate
Bates-----	20-40	Bedrock (paralithic)	---	Weakly cemented	---	Low	Moderate
059EA: Eram-----	20-40	Bedrock (paralithic)	---	Weakly cemented	None	High	Moderate
Lebo-----	20-40	Bedrock (paralithic)	---	Weakly cemented	None	Moderate	Low
059EC: Eram-----	20-40	Bedrock (paralithic)	---	Weakly cemented	None	High	Moderate
Lula-----	40-60	Bedrock (lithic)	---	Indurated	---	Moderate	Moderate
059LN: Lebo-----	20-40	Bedrock (paralithic)	---	Weakly cemented	None	Moderate	Low
Rock Outcrop----	---	---	---	---	None	---	---
059MB: Mason-----	---	---	---	---	---	Moderate	Moderate
059OS: Osage-----	---	---	---	---	---	High	Moderate
059VB: Verdigris-----	---	---	---	---	---	Low	Low
087EC: Eudora-----	---	---	---	---	High	Low	Low
Bismarckgrove----	---	---	---	---	High	Low	Low
087FU: Fluvaquents-----	---	---	---	---	High	High	Low
087MU: Muscotah-----	---	---	---	---	Moderate	High	Low
091EB: Eudora-----	---	---	---	---	High	Low	Low
091MC: Morrill-----	---	---	---	---	Moderate	Moderate	Moderate
139CM: Clareson-----	20-40	Bedrock (lithic)	---	Indurated	---	High	Moderate
Eram-----	20-40	Bedrock (paralithic)	---	Weakly cemented	None	High	Moderate
139ED: Elmont-----	40-60	Bedrock (paralithic)	---	Weakly cemented	High	Moderate	Low
139LU: Lula-----	40-60	Bedrock (lithic)	---	Indurated	Moderate	High	Moderate
177MF: Martin-----	---	---	---	---	High	High	Low
177SW: Stony Steep Land	---	---	---	---	---	---	---
Vinland-----	10-20	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Moderate
601KW: Konawa-----	---	---	---	---	---	Moderate	Moderate
601SA: Sarpy-----	---	---	---	---	Low	Low	Low
Haynie-----	---	---	---	---	High	Low	Low
2326: Kenoma-----	---	---	---	---	---	High	Moderate
2540: Leanna-----	---	---	---	---	None	High	Moderate
2797: Morrill, stony--	---	---	---	---	Moderate	Moderate	Moderate
3460: Sibleyville----	20-40	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Moderate
Vinland-----	10-20	Bedrock (paralithic)	---	Noncemented	Moderate	Low	Moderate

Map symbol and soil name	Restrictive layer				Potential for Frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated Steel	Concrete
3461: Sibleyville, eroded-----	20-40	In Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Moderate
3462: Sibleyville-----	20-40	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Moderate
3464: Sibleyville-----	20-40	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Moderate
Vinland-----	10-20	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Moderate
3494: Summit-----	---	---	---	---	None	High	Low
3495: Summit-----	---	---	---	---	None	High	Low
3815: Verdigris-----	---	---	---	---	---	Low	Low
3926: Water (less Than 40-----	---	---	---	---	---	---	---
3951: Woodson-----	---	---	---	---	Low	High	Moderate
AED: Arents, Earthen Dam-----	---	---	---	---	---	---	---
Be: Basehor-----	8-20	Bedrock (lithic)	---	Strongly cemented	Moderate	Low	Moderate
BOP: Borrow Pits-----	---	---	---	---	---	---	---
Et: Eudora-----	---	---	---	---	High	Low	Low
Ev: Eudora-----	---	---	---	---	High	Low	Low
Kimo-----	---	---	---	---	High	High	Low
Ew: Eudora-----	---	---	---	---	High	Low	Low
Kimo-----	---	---	---	---	High	High	Low
Gm: Gymer-----	---	---	---	---	Moderate	Moderate	Moderate
Gy: Gymer-----	---	---	---	---	Moderate	Moderate	Moderate
Ju: Judson-----	---	---	---	---	High	Moderate	Low
KA: Kennebec-----	---	---	---	---	High	Moderate	Low
Kb: Kennebec-----	---	---	---	---	High	Moderate	Low
Kc: Kennebec-----	---	---	---	---	High	Moderate	Low
Km: Kimo-----	---	---	---	---	High	High	Low
Le: Leanna-----	---	---	---	---	---	High	Moderate
M-W: Miscellaneous Water-----	---	---	---	---	---	---	---
Mb: Martin-----	---	---	---	---	High	High	Low
Mc: Martin-----	---	---	---	---	High	High	Low
Mh: Martin, eroded--	---	---	---	---	High	High	Low
Mo: Martin-----	---	---	---	---	High	High	Low
Osk-----	20-40	Bedrock (lithic)	---	Indurated	Moderate	Moderate	Moderate
Mr: Morrill-----	---	---	---	---	Moderate	Moderate	Moderate
Ms: Morrill-----	---	---	---	---	Moderate	Moderate	Moderate
Oe: Osk-----	20-40	Bedrock (lithic)	---	Indurated	Moderate	Moderate	Moderate
Pb: Pawnee-----	---	---	---	---	High	High	Low
Pc: Pawnee-----	---	---	---	---	High	High	Low
Ph: Pawnee, eroded--	---	---	---	---	High	High	Low
QUA: Quarries-----	---	---	---	---	---	---	---
Re: Reading-----	---	---	---	---	High	Moderate	Low
Ro: River Wash-----	---	---	---	---	---	---	---
Sa: Sand Pit-----	---	---	---	---	---	---	---



Map symbol and soil name	Restrictive layer				Potential for Frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated Steel	Concrete
		In	In				
Sb: Sarpy-----	---	---	---	---	Low	Low	Low
Eudora-----	---	---	---	---	High	Low	Low
Sc: Sharpsburg-----	---	---	---	---	High	Moderate	Moderate
Sd: Sharpsburg-----	---	---	---	---	High	Moderate	Moderate
Sh: Sibleyville-----	20-40	Bedrock (paralithic)	---	Moderately cemented	Moderate	Low	Moderate
So: Sibleyville, eroded-----	20-40	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Moderate
Ss: Sibleyville-----	20-40	Bedrock (paralithic)	---	Moderately cemented	Moderate	Low	Moderate
St: Sibleyville, eroded-----	20-40	Bedrock (paralithic)	---	Moderately cemented	Moderate	Low	Moderate
SU: Summit-----	---	---	---	---	---	High	Low
Sv: Sibleyville-----	20-40	Bedrock (paralithic)	---	Moderately cemented	Moderate	Low	Moderate
SVV: Sibleyville-----	20-40	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Moderate
Vinland-----	10-20	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Moderate
Sw: Sogn-----	4-20	Bedrock (lithic)	---	Indurated	Moderate	Low	Low
Vinland-----	10-20	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Moderate
Sx: Rock Outcrop----	0-0	Bedrock (lithic)	---	---	---	---	---
Vinland-----	10-20	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Moderate
Tc: Thurman-----	---	---	---	---	Low	Low	Low
VA: Verdigris-----	---	---	---	---	---	Low	Low
Vc: Vinland-----	10-20	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Moderate
Vh: Vinland-----	10-20	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Moderate
Vm: Vinland-----	10-20	Bedrock (paralithic)	---	Weakly cemented	Moderate	Low	Moderate
Martin-----	---	---	---	---	High	High	Low
W: Water (< 40 Acres)-----	---	---	---	---	---	---	---
Wc: Wabash-----	---	---	---	---	Moderate	High	Moderate
Wh: Wabash-----	---	---	---	---	Moderate	High	Moderate
Wo: Woodson-----	---	---	---	---	High	High	Moderate
Ws: Woodson-----	---	---	---	---	High	High	Moderate
Wx: Woodson, eroded-	---	---	---	---	High	High	Moderate

WATER MANAGEMENT  
Douglas County, Kansas

The soils of the survey area are rated in the Water Management table according to limitations that affect their suitability for water management. Soils are rated for pond reservoir areas, drainage, irrigation, terraces and diversions, and grassed waterways. Restrictive features that affect each soil for the specified use is also provided in the table.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. Not limited indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. Slightly limited indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. Moderately limited indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. Limited indicates that the soil has one or more features that are significant limitations for the specified use. The limitations can be overcome, but generally require special design, soil reclamation, or installation procedures that may result in additional expense. Fair performance and moderate to high maintenance can be expected. Very limited indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Limitation class terms, such as very limited or limited, etc., limitation ratings, and numerical ratings are shown for each soil feature listed. As many as three soil features may be listed for each soil component if applicable. The overall limitation rating for the soil component is based on the most severe limitation.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects traffic ability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditch banks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, and sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a very limited hazard of wind erosion or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, which conduct surface water to outlets at a non-erosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts and sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

WATER MANAGEMENT--Continued  
Douglas County, Kansas

(The information in this report indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Features affecting--			
	Drainage	Irrigation	Terraces and diversions	Grassed waterways
059BC: Bates-----	Limitation: deep to water	Limitation: depth to rock	Limitation: depth to rock	Limitation: depth to rock
059BD: Bates-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: depth to rock	Limitation: depth to rock
Collinsville----	Limitation: deep to water	Limitation: large stones slope depth to rock	Limitation: large stones depth to rock	Limitation: large stones depth to rock
059BH: Bates-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: depth to rock	Limitation: depth to rock
Collinsville----	Limitation: deep to water	Limitation: large stones slope depth to rock	Limitation: large stones slope depth to rock	Limitation: large stones slope depth to rock
059BS: Bolivar-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope depth to rock
Hector-----	Limitation: deep to water	Limitation: slope depth to rock droughty	Limitation: slope depth to rock	Limitation: slope depth to rock droughty
059CM: Clareson-----	Limitation: deep to water	Limitation: large stones slope droughty	Limitation: large stones slope depth to rock	Limitation: large stones slope droughty
Eram-----	Limitation: percs slowly slope depth to rock	Limitation: percs slowly slope wetness	Limitation: erodes easily wetness depth to rock	Limitation: erodes easily wetness depth to rock
059DN: Dennis-----	Limitation: percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Bates-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: depth to rock	Limitation: depth to rock
059EA: Eram-----	Limitation: percs slowly slope depth to rock	Limitation: percs slowly slope wetness	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope wetness
Lebo-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope depth to rock
059EC: Eram-----	Limitation: percs slowly slope depth to rock	Limitation: percs slowly slope wetness	Limitation: erodes easily wetness depth to rock	Limitation: erodes easily wetness depth to rock
Lula-----	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily large stones	Limitation: erodes easily large stones
059LN: Lebo-----	Limitation: deep to water	Limitation: slope depth to rock droughty	Limitation: large stones slope depth to rock	Limitation: large stones slope droughty
Rock Outcrop----	---	---	---	---
059MB: Mason-----	Limitation: deep to water	Limitation: erodes easily	Limitation: erodes easily	Limitation: erodes easily
059OS: Osage-----	Limitation: flooding percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
059VB: Verdigris-----	Limitation: deep to water	Limitation: flooding	Favorable	Favorable
087EC: Eudora-----	Limitation: deep to water	Limitation: flooding	Limitation: erodes easily	Limitation: erodes easily
Bismarckgrove---	Limitation: flooding frost action	Limitation: flooding percs slowly wetness	Limitation: erodes easily wetness	Limitation: erodes easily

WATER MANAGEMENT--Continued  
Douglas County, Kansas

(The information in this report indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Features affecting--			
	Drainage	Irrigation	Terraces and diversions	Grassed waterways
087FU: Fluvaquents-----	Limitation: flooding frost action	Limitation: erodes easily flooding wetness	Limitation: erodes easily wetness	Limitation: erodes easily
087MU: Muscotah-----	Limitation: flooding percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly
091EB: Eudora-----	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily
091MC: Morrill-----	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily
139CM: Clareson-----	Limitation: deep to water	Limitation: large stones slope droughty	Limitation: large stones slope depth to rock	Limitation: large stones slope droughty
Eram-----	Limitation: percs slowly slope depth to rock	Limitation: percs slowly slope wetness	Limitation: erodes easily wetness depth to rock	Limitation: erodes easily wetness depth to rock
139ED: Elmont-----	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily
139LU: Lula-----	Limitation: deep to water	Limitation: erodes easily	Limitation: erodes easily large stones	Limitation: erodes easily large stones
177MF: Martin-----	Limitation: frost action percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily slope wetness	Limitation: erodes easily slope wetness
177SW: Stony Steep Land Vinland-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope depth to rock
601KW: Konawa-----	Limitation: deep to water	Limitation: slope soil blowing	Limitation: slope soil blowing	Limitation: slope
601SA: Sarpy-----	Limitation: deep to water	Limitation: fast intake soil blowing droughty	Limitation: too sandy soil blowing	Limitation: droughty
Haynie-----	Limitation: deep to water	Limitation: erodes easily flooding soil blowing	Limitation: erodes easily soil blowing	Limitation: erodes easily
2326: Kenoma-----	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
2540: Leanna-----	Limitation: flooding percs slowly	Limitation: flooding percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
2797: Morrill, stony--	Limitation: deep to water	Limitation: slope	Limitation: slope	Limitation: slope
3460: Sibleyville----	Limitation: deep to water	Limitation: area reclaim slope soil blowing depth to rock	Limitation: area reclaim slope soil blowing depth to rock	Limitation: area reclaim slope
Vinland-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: area reclaim depth to rock	Limitation: area reclaim
3461: Sibleyville, eroded-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: area reclaim	Limitation: area reclaim

WATER MANAGEMENT--Continued  
Douglas County, Kansas

(The information in this report indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Features affecting--			
	Drainage	Irrigation	Terraces and diversions	Grassed waterways
3462: Sibleyville-----	Limitation: deep to water	Limitation: slope thin layer	Limitation: area reclaim	Limitation: area reclaim
3464: Sibleyville-----	Limitation: deep to water	Limitation: slope thin layer	Limitation: area reclaim	Limitation: area reclaim
Vinland-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: area reclaim	Limitation: area reclaim
3494: Summit-----	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly
3495: Summit-----	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly
3815: Verdigris-----	Limitation: deep to water	Limitation: flooding	Favorable	Favorable
3926: Water (less Than 40-----	---	---	---	---
3951: Woodson-----	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
AED: Arents, Earthen Dam-----	---	---	---	---
Be: Basehor-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope depth to rock
BOP: Borrow Pits-----	---	---	---	---
Et: Eudora-----	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily
Ev: Eudora-----	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily
Kimo-----	Limitation: frost action percs slowly cutbanks cave	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily wetness	Limitation: erodes easily percs slowly
Ew: Eudora-----	Limitation: deep to water	Limitation: soil blowing	Limitation: erodes easily soil blowing	Limitation: erodes easily
Kimo-----	Limitation: frost action percs slowly cutbanks cave	Limitation: percs slowly wetness soil blowing	Limitation: erodes easily wetness soil blowing	Limitation: erodes easily percs slowly
Gm: Gymer-----	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily
Gy: Gymer-----	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily
Ju: Judson-----	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily
KA: Kennebec-----	Limitation: deep to water	Limitation: flooding	Favorable	Favorable
Kb: Kennebec-----	Limitation: deep to water	Limitation: flooding	Favorable	Favorable
Kc: Kennebec-----	Limitation: deep to water	Limitation: flooding	Limitation: erodes easily	Limitation: erodes easily
Km: Kimo-----	Limitation: frost action percs slowly cutbanks cave	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily wetness	Limitation: erodes easily percs slowly

WATER MANAGEMENT--Continued  
Douglas County, Kansas

(The information in this report indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Features affecting--			
	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Le: Leanna-----	Limitation: flooding percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
M-W: Miscellaneous Water-----	---	---	---	---
Mb: Martin-----	Limitation: frost action percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Mc: Martin-----	Limitation: frost action percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Mh: Martin, eroded--	Limitation: frost action percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Mo: Martin-----	Limitation: frost action percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Oska-----	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily percs slowly depth to rock	Limitation: erodes easily percs slowly depth to rock
Mr: Morrill-----	Limitation: deep to water	Limitation: slope	Favorable	Favorable
Ms: Morrill-----	Limitation: deep to water	Limitation: slope	Limitation: slope	Limitation: slope
Oe: Oska-----	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: erodes easily percs slowly depth to rock	Limitation: erodes easily percs slowly depth to rock
Pb: Pawnee-----	Limitation: frost action percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Pc: Pawnee-----	Limitation: frost action percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Ph: Pawnee, eroded--	Limitation: frost action percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
QUA: Quarries-----	---	---	---	---
Re: Reading-----	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily
Ro: River Wash-----	---	---	---	---
Sa: Sand Pit-----	---	---	---	---
Sb: Sarpy-----	Limitation: deep to water	Limitation: fast intake soil blowing droughty	Limitation: too sandy soil blowing	Limitation: droughty
Eudora-----	Limitation: deep to water	Limitation: flooding soil blowing	Limitation: erodes easily soil blowing	Limitation: erodes easily
Sc: Sharpsburg-----	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily
Sd: Sharpsburg-----	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily
Sh: Sibleyville-----	Limitation: slope deep to water	Limitation: slope depth to rock	Limitation: depth to rock	Limitation: depth to rock

WATER MANAGEMENT--Continued  
Douglas County, Kansas

(The information in this report indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Features affecting--			
	Drainage	Irrigation	Terraces and diversions	Grassed waterways
So: Sibleyville, eroded-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: area reclaim	Limitation: area reclaim
Ss: Sibleyville-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: depth to rock	Limitation: depth to rock
St: Sibleyville, eroded-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: depth to rock	Limitation: depth to rock
SU: Summit-----	Limitation: percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly
Sv: Sibleyville-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope depth to rock
SVV: Sibleyville-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: depth to rock	Limitation: depth to rock
Vinland-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: depth to rock	Limitation: depth to rock
Sw: Sogn-----	Limitation: slope depth to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope depth to rock
Vinland-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope depth to rock
Sx: Rock Outcrop----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope depth to rock
Vinland-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope depth to rock
Tc: Thurman-----	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: too sandy soil blowing	Limitation: droughty
VA: Verdigris-----	Limitation: deep to water	Limitation: flooding	Favorable	Favorable
Vc: Vinland-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily depth to rock
Vh: Vinland-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily depth to rock
Vm: Vinland-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope depth to rock
Martin-----	Limitation: frost action percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily slope wetness	Limitation: erodes easily slope wetness
W: Water (< 40 Acres)-----	---	---	---	---
Wc: Wabash-----	Limitation: flooding percs slowly	Limitation: flooding percs slowly wetness	Limitation: percs slowly wetness	Limitation: percs slowly wetness
Wh: Wabash-----	Limitation: flooding percs slowly	Limitation: slow intake wetness droughty	Limitation: percs slowly wetness	Limitation: percs slowly wetness droughty
Wo: Woodson-----	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness

WATER MANAGEMENT--Continued  
Douglas County, Kansas

(The information in this report indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Features affecting--			
	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Ws: Woodson-----	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Wx: Woodson, eroded-	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness



WATER MANAGEMENT--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer- fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
059BC: Bates-----	90	Somewhat limited Seepage Depth to bedrock	0.70 0.11	Somewhat limited Piping Thin layer Seepage	1.00 0.85 0.03	Very limited Deep to water	1.00
059BD: Bates-----	60	Somewhat limited Seepage Depth to bedrock	0.70 0.02	Somewhat limited Piping Thin layer Seepage	1.00 0.56 0.03	Very limited Deep to water	1.00
Collinsville-----	25	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Thin layer Piping	1.00 1.00	Very limited Deep to water	1.00
059BH: Bates-----	50	Somewhat limited Seepage Depth to bedrock	0.70 0.05	Very limited Piping Thin layer Seepage	1.00 0.74 0.03	Very limited Deep to water	1.00
Collinsville-----	35	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Thin layer Piping	1.00 1.00	Very limited Deep to water	1.00
059BS: Bolivar-----	50	Somewhat limited Seepage Depth to bedrock	0.70 0.05	Somewhat limited Thin layer Piping	0.74 0.73	Very limited Deep to water	1.00
Hector-----	40	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Thin layer	1.00	Very limited Deep to water	1.00
059CM: Clareson-----	55	Somewhat limited Depth to bedrock	0.95	Somewhat limited Thin layer Content of large stones	0.95 0.81	Very limited Deep to water	1.00
Eram-----	30	Somewhat limited Depth to bedrock	0.02	Very limited Depth to saturated zone Thin layer Hard to pack	1.00 0.56 0.32	Very limited Deep to water	1.00
059DN: Dennis-----	60	Not limited		Very limited Depth to saturated zone Hard to pack	1.00 0.24	Very limited Deep to water	1.00
Bates-----	30	Somewhat limited Seepage Depth to bedrock	0.70 0.05	Very limited Piping Thin layer Seepage	1.00 0.74 0.03	Very limited Deep to water	1.00
059EA: Eram-----	55	Somewhat limited Depth to bedrock	0.02	Very limited Depth to saturated zone Thin layer Hard to pack	1.00 0.56 0.32	Very limited Slow refill Cutbanks cave	1.00 0.10
Lebo-----	35	Somewhat limited Seepage Depth to bedrock	0.70 0.17	Somewhat limited Thin layer	0.91	Very limited Deep to water	1.00
059EC: Eram-----	60	Somewhat limited Depth to bedrock	0.02	Very limited Depth to saturated zone Thin layer Hard to pack	1.00 0.56 0.32	Very limited Slow refill Cutbanks cave	1.00 0.10
Lula-----	25	Somewhat limited Seepage Depth to bedrock	0.70 0.29	Somewhat limited Thin layer Hard to pack	0.29 0.23	Very limited Deep to water	1.00

WATER MANAGEMENT--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer- fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
059LN: Lebo-----	75	Somewhat limited Seepage Slope Depth to bedrock	0.70 0.50 0.17	Somewhat limited Thin layer	0.91	Very limited Deep to water	1.00
Rock Outcrop-----	15	Not rated		Not rated		Not rated	
059MB: Mason-----	90	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.59	Very limited Deep to water	1.00
059OS: Osage-----	85	Not limited		Very limited Depth to saturated zone Hard to pack	1.00 0.83	Very limited Slow refill Cutbanks cave	1.00 0.10
059VB: Verdigris-----	85	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.60	Very limited Deep to water	1.00
087EC: Eudora-----	65	Somewhat limited Seepage	0.70	Very limited Piping	1.00	Very limited Deep to water	1.00
Bismarckgrove-----	20	Somewhat limited Seepage	0.70	Very limited Piping Seepage	1.00 0.22	Very limited Deep to water	1.00
087FU: Fluvaquents-----	100	Somewhat limited Seepage	0.70	Very limited Piping Depth to saturated zone	1.00 0.93	Somewhat limited Slow refill Cutbanks cave Deep to water	0.30 0.10 0.03
087MU: Muscotah-----	85	Not limited		Somewhat limited Depth to saturated zone Hard to pack	0.95 0.88	Very limited Slow refill Cutbanks cave Deep to water	1.00 0.10 0.02
091EB: Eudora-----	85	Somewhat limited Seepage	0.70	Very limited Piping	1.00	Very limited Deep to water	1.00
091MC: Morrill-----	85	Somewhat limited Seepage	0.57	Somewhat limited Piping	0.41	Very limited Deep to water	1.00
139CM: Clareson-----	55	Somewhat limited Depth to bedrock Seepage	0.98 0.00	Somewhat limited Thin layer Content of large stones	0.98 0.53	Very limited Deep to water	1.00
Eram-----	30	Somewhat limited Depth to bedrock	0.17	Very limited Depth to saturated zone Thin layer Hard to pack	1.00 0.91 0.32	Very limited Deep to water	1.00
139ED: Elmont-----	85	Somewhat limited Seepage Depth to bedrock	0.05 0.00	Somewhat limited Thin layer Piping	0.06 0.01	Very limited Deep to water	1.00
139LU: Lula-----	85	Somewhat limited Seepage Depth to bedrock	0.70 0.29	Somewhat limited Thin layer Piping	0.29 0.12	Very limited Deep to water	1.00
177MF: Martin-----	90	Not limited		Very limited Depth to saturated zone	1.00	Very limited Slow refill	1.00

WATER MANAGEMENT--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer- fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
177SW: Stony Steep Land----	60	Not rated		Hard to pack	0.57	Cutbanks cave	0.10
Vinland-----	26	Very limited Seepage Depth to bedrock Slope	1.00 0.58 0.28	Very limited Thin layer Piping	1.00 0.42	Very limited Deep to water	1.00
601KW: Konawa-----	90	Somewhat limited Seepage Slope	0.70 0.02	Very limited Piping	1.00	Very limited Deep to water	1.00
601SA: Sarpy-----	55	Very limited Seepage	1.00	Somewhat limited Seepage	0.50	Very limited Deep to water	1.00
Haynie-----	35	Somewhat limited Seepage	0.70	Very limited Piping Seepage	1.00 0.01	Very limited Deep to water	1.00
2326: Kenoma-----	90	Not limited		Very limited Depth to saturated zone Hard to pack	1.00 0.98	Very limited Slow refill Cutbanks cave	1.00 0.10
2540: Leanna-----	85	Somewhat limited Seepage	0.05	Very limited Depth to saturated zone	1.00	Very limited Deep to water	1.00
2797: Morrill, stony-----	85	Somewhat limited Seepage	0.70	Somewhat limited Seepage	0.04	Very limited Deep to water	1.00
3460: Sibleyville-----	50	Somewhat limited Seepage Depth to bedrock Slope	0.70 0.19 0.00	Somewhat limited Thin layer Seepage	0.93 0.01	Very limited Deep to water	1.00
Vinland-----	35	Very limited Seepage Depth to bedrock Slope	1.00 0.58 0.00	Very limited Thin layer Piping	1.00 0.50	Very limited Deep to water	1.00
3461: Sibleyville, eroded-	85	Somewhat limited Seepage Depth to bedrock	0.70 0.19	Somewhat limited Thin layer Seepage	0.93 0.01	Very limited Deep to water	1.00
3462: Sibleyville-----	85	Somewhat limited Seepage Depth to bedrock	0.70 0.19	Somewhat limited Thin layer Seepage	0.93 0.01	Very limited Deep to water	1.00
3464: Sibleyville-----	50	Somewhat limited Seepage	0.70	Not limited		Very limited Deep to water	1.00
Vinland-----	30	Very limited Seepage Depth to bedrock	1.00 0.58	Very limited Thin layer Piping	1.00 0.50	Very limited Deep to water	1.00
3494: Summit-----	85	Not limited		Somewhat limited Depth to saturated zone Hard to pack	0.86 0.37	Very limited Slow refill Cutbanks cave Deep to water	1.00 0.10 0.06
3495: Summit-----	85	Not limited		Very limited Depth to saturated zone	1.00	Very limited Deep to water	1.00

WATER MANAGEMENT--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer- fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3815: Verdigris-----	85	Somewhat limited Seepage	0.70	Hard to pack  Somewhat limited Piping	0.37  0.41	Very limited Deep to water	1.00
3926: Water (less Than 40-	100	Very limited Seepage Slope	1.00 0.50	Very limited Hard to pack	1.00	Very limited Deep to water	1.00
3951: Woodson-----	85	Not limited		Very limited Depth to saturated zone Hard to pack	1.00 0.76	Very limited Deep to water	1.00
AED: Arents, Earthen Dam-	100	Not rated		Not rated		Not rated	
Be: Basehor-----	50	Very limited Seepage Depth to bedrock Slope	1.00 1.00 0.00	Very limited Thin layer Piping Seepage	1.00 1.00 0.03	Very limited Deep to water	1.00
BOP: Borrow Pits-----	100	Not rated		Not rated		Not rated	
Et: Eudora-----	90	Somewhat limited Seepage	0.70	Very limited Piping	1.00	Very limited Deep to water	1.00
Ev: Eudora-----	60	Somewhat limited Seepage	0.70	Very limited Piping	1.00	Very limited Deep to water	1.00
Kimo-----	30	Somewhat limited Seepage	0.70	Very limited Depth to saturated zone Piping	1.00 0.91	Somewhat limited Slow refill Cutbanks cave Deep to water	0.30 0.10 0.00
Ew: Eudora-----	65	Somewhat limited Seepage	0.70	Very limited Piping Seepage	1.00 0.10	Very limited Deep to water	1.00
Kimo-----	25	Somewhat limited Seepage	0.70	Very limited Piping Seepage	1.00 0.08	Somewhat limited Deep to water Slow refill Cutbanks cave	0.81 0.30 0.10
Gm: Gymer-----	85	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.04	Very limited Deep to water	1.00
Gy: Gymer-----	88	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.02	Very limited Deep to water	1.00
Ju: Judson-----	85	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.25	Very limited Deep to water	1.00
KA: Kennebec-----	99	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.84	Somewhat limited Deep to water Slow refill Cutbanks cave	0.81 0.30 0.10
Kb: Kennebec-----	95	Somewhat limited Seepage	0.70	Somewhat limited Piping Depth to saturated zone	0.71 0.09	Somewhat limited Deep to water Slow refill	0.54 0.30

WATER MANAGEMENT--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer- fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Kc: Kennebec-----	88	Somewhat limited Seepage	0.70	Very limited Piping Depth to saturated zone	1.00 0.09	Cutbanks cave Somewhat limited Deep to water Slow refill	0.10 0.54 0.30
Km: Kimo-----	90	Somewhat limited Seepage	0.70	Very limited Depth to saturated zone Piping	1.00 0.91	Cutbanks cave Somewhat limited Slow refill Cutbanks cave Deep to water	0.10 0.30 0.10 0.00
Le: Leanna, drained----	85	Somewhat limited Seepage	0.05	Very limited Depth to saturated zone	1.00	Very limited Deep to water	1.00
M-W: Miscellaneous Water-	100	Not rated		Not rated		Not rated	
Mb: Martin-----	90	Not limited		Very limited Depth to saturated zone Hard to pack	1.00 0.63	Very limited Slow refill Cutbanks cave Deep to water	1.00 0.10 0.00
Mc: Martin-----	85	Not limited		Very limited Depth to saturated zone Hard to pack	1.00 0.63	Very limited Slow refill Cutbanks cave Deep to water	1.00 0.10 0.00
Mh: Martin, eroded-----	85	Not limited		Somewhat limited Hard to pack	0.63	Very limited Deep to water	1.00
Mo: Martin-----	40	Not limited		Very limited Depth to saturated zone Hard to pack	1.00 0.63	Very limited Slow refill Cutbanks cave Deep to water	1.00 0.10 0.00
Oska-----	30	Somewhat limited Depth to bedrock	0.56	Somewhat limited Thin layer Hard to pack	0.56 0.28	Very limited Deep to water	1.00
Mr: Morrill-----	90	Somewhat limited Seepage	0.57	Somewhat limited Piping	0.13	Very limited Deep to water	1.00
Ms: Morrill-----	85	Somewhat limited Seepage	0.57	Somewhat limited Piping	0.13	Very limited Deep to water	1.00
Oe: Oska-----	88	Somewhat limited Depth to bedrock	0.56	Somewhat limited Thin layer Hard to pack	0.56 0.28	Very limited Deep to water	1.00
Pb: Pawnee-----	90	Not limited		Very limited Depth to saturated zone	1.00	Somewhat limited Slow refill Cutbanks cave	0.95 0.10
Pc: Pawnee-----	85	Not limited		Very limited Depth to saturated zone	1.00	Very limited Deep to water	1.00

WATER MANAGEMENT--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer- fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ph: Pawnee, eroded-----	90	Not limited		Very limited Depth to saturated zone	1.00	Very limited Deep to water	1.00
QUA: Quarries-----	100	Not rated		Not rated		Not rated	
Re: Reading-----	90	Somewhat limited Seepage	0.57	Somewhat limited Piping	0.00	Very limited Deep to water	1.00
Ro: River Wash-----	100	Not rated		Not rated		Not rated	
Sa: Sand Pit-----	100	Not rated		Not rated		Not rated	
Sb: Sarpy-----	55	Very limited Seepage	1.00	Somewhat limited Seepage	0.50	Very limited Deep to water	1.00
Eudora-----	45	Somewhat limited Seepage	0.70	Very limited Piping Seepage	1.00 0.08	Very limited Deep to water	1.00
Sc: Sharpsburg-----	88	Somewhat limited Seepage	0.70	Not limited		Very limited Deep to water	1.00
Sd: Sharpsburg-----	85	Somewhat limited Seepage	0.70	Not limited		Very limited Deep to water	1.00
Sh: Sibleyville-----	90	Somewhat limited Seepage Depth to bedrock	0.70 0.19	Somewhat limited Thin layer Seepage	0.93 0.04	Very limited Deep to water	1.00
So: Sibleyville, eroded-	85	Somewhat limited Seepage Depth to bedrock	0.70 0.19	Somewhat limited Thin layer Seepage	0.93 0.01	Very limited Deep to water	1.00
Ss: Sibleyville-----	60	Somewhat limited Seepage Depth to bedrock	0.70 0.08	Somewhat limited Thin layer Seepage	0.81 0.04	Very limited Deep to water	1.00
St: Sibleyville, eroded-	50	Somewhat limited Seepage Depth to bedrock	0.70 0.19	Somewhat limited Thin layer Seepage	0.93 0.04	Very limited Deep to water	1.00
SU: Summit-----	90	Not limited		Very limited Depth to saturated zone Hard to pack	1.00 0.38	Very limited Slow refill Cutbanks cave Deep to water	1.00 0.10 0.00
Sv: Sibleyville-----	50	Somewhat limited Seepage Depth to bedrock Slope	0.70 0.19 0.00	Somewhat limited Thin layer Seepage	0.93 0.04	Very limited Deep to water	1.00
SVV: Sibleyville-----	45	Somewhat limited Seepage Depth to bedrock	0.70 0.13	Somewhat limited Thin layer	0.88	Very limited Deep to water	1.00
Vinland-----	35	Very limited Seepage	1.00	Very limited Thin layer	1.00	Very limited Deep to water	1.00

WATER MANAGEMENT--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer- fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
		Depth to bedrock	0.53	Piping	0.88		
Sw: Sogn-----	55	Very limited Seepage Depth to bedrock Slope	1.00 1.00 0.01	Very limited Thin layer Piping	1.00 0.12	Very limited Deep to water	1.00
Vinland-----	30	Very limited Seepage Depth to bedrock Slope	1.00 0.58 0.00	Very limited Thin layer Piping	1.00 0.50	Very limited Deep to water	1.00
Sx: Rock Outcrop-----	60	Not rated		Not rated		Not rated	
Vinland-----	26	Very limited Seepage Depth to bedrock Slope	1.00 0.58 0.28	Very limited Thin layer Piping	1.00 0.50	Very limited Deep to water	1.00
Tc: Thurman-----	35	Very limited Seepage	1.00	Somewhat limited Seepage	0.90	Very limited Deep to water	1.00
VA: Verdigris-----	88	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.50	Very limited Deep to water	1.00
Vc: Vinland-----	50	Very limited Seepage Depth to bedrock	1.00 0.61	Very limited Thin layer Piping	1.00 0.36	Very limited Deep to water	1.00
Vh: Vinland-----	60	Very limited Seepage Depth to bedrock	1.00 0.58	Very limited Thin layer Piping	1.00 0.50	Very limited Deep to water	1.00
Vm: Vinland-----	40	Very limited Seepage Depth to bedrock Slope	1.00 0.58 0.00	Very limited Thin layer Piping	1.00 0.50	Very limited Deep to water	1.00
Martin-----	25	Not limited		Very limited Depth to saturated zone Hard to pack	1.00 0.63	Very limited Slow refill Cutbanks cave Deep to water	1.00 0.10 0.00
W: Water (< 40 Acres)--	100	Very limited Seepage Slope	1.00 0.50	Very limited Hard to pack	1.00	Very limited Deep to water	1.00
Wc: Wabash-----	88	Not limited		Very limited Depth to saturated zone Hard to pack	1.00 1.00	Very limited Slow refill Cutbanks cave	1.00 0.10
Wh: Wabash-----	90	Not limited		Very limited Depth to saturated zone Hard to pack	1.00 1.00	Very limited Slow refill Cutbanks cave	1.00 0.10
Wo: Woodson-----	90	Not limited		Very limited Depth to saturated zone Hard to pack	1.00 0.78	Very limited Deep to water	1.00
Ws: Woodson-----	90	Not limited		Very limited		Very limited	

WATER MANAGEMENT--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer- fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Wx: Woodson, eroded-----	90	Not limited		Depth to saturated zone Hard to pack	1.00	Deep to water	1.00
				Very limited Depth to saturated zone Hard to pack	0.78		
					1.00	Very limited Deep to water	1.00
					0.81		



SANITARY FACILITIES  
Douglas County, Kansas

Sanitary Facilities

The following tables show the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, sanitary landfills, and daily cover for landfill. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. Not limited indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. Slightly limited indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. Somewhat limited indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. Very limited indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Soil permeability is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a permeability rate of more than 2 inches per hour are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

A trench sanitary landfill is an area where solid waste is placed in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil excavated at the site. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill. The ratings in the table are based on the soil properties that affect the risk of pollution, the ease of excavation, trafficability, and revegetation. These properties include permeability, depth to bedrock or a cemented pan, depth to a water table, ponding, slope, flooding, texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, onsite investigation may be needed.

Hard, nonrippable bedrock, creviced bedrock, or highly permeable strata in or directly below the proposed trench bottom can affect the ease of excavation and the hazard of ground-water pollution. Slope affects construction of the trenches and the movement of surface water around the landfill. It also affects the construction and performance of roads in areas of the landfill.

Soil texture and consistence affect the ease with which the trench is dug and the ease with which the soil can be used as daily or final cover. They determine the workability of the soil when dry and when wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact and are difficult to place as a uniformly thick cover over a layer of refuse.

The soil material used as the final cover for a trench landfill should be suitable for plants. It should not have excess sodium or salts and should not be too acid. The surface layer generally has the best workability, the highest content of organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

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In an area sanitary landfill, solid waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site. A final cover of soil material at least 2 feet thick is placed over the completed landfill. The ratings in the table are based on the soil properties that affect trafficability and the risk of pollution. These properties include flooding, permeability, depth to a water table, ponding, slope, and depth to bedrock or a cemented pan.

Flooding is a serious problem because it can result in pollution in areas downstream from the landfill. If permeability is too rapid or if fractured bedrock, a fractured cemented pan, or the water table is close to the surface, the leachate can contaminate the water supply. Slope is a consideration because of the extra grading required to maintain roads in the steeper areas of the landfill. Also, leachate may flow along the surface of the soils in the steeper areas and cause difficult seepage problems.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste. The ratings in the table also apply to the final cover for a landfill. They are based on the soil properties that affect workability, the ease of digging, and the ease of moving and spreading the material over the refuse daily during wet and dry periods. These properties include soil texture, depth to a water table, ponding, rock fragments, slope, depth to bedrock or a cemented pan, reaction, and content of salts, sodium, or lime.

Loamy or silty soils that are free of large stones and excess gravel are the best cover for a landfill. Clayey soils may be sticky and difficult to spread; sandy soils are subject to wind erosion.

Slope affects the ease of excavation and of moving the cover material. Also, it can influence runoff, erosion, and reclamation of the borrow area.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. It should not have excess sodium, salts, or lime and should not be too acid.

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(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
059BC: Bates-----	90	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock Seepage Slope	1.00 0.50 0.09
059BD: Bates-----	60	Very limited Depth to bedrock  Restricted permeability	1.00  0.50	Very limited Depth to soft bedrock Slope  Seepage	1.00  0.67 0.50
Collinsville-----	25	Very limited Depth to bedrock	1.00	Very limited Depth to hard bedrock Seepage Slope	1.00 1.00 0.67
059BH: Bates-----	50	Very limited Depth to bedrock  Restricted permeability Slope	1.00  0.50 0.00	Very limited Depth to soft bedrock Slope  Seepage	1.00 1.00 0.50
Collinsville-----	35	Very limited Depth to bedrock  Slope	1.00  0.16	Very limited Depth to hard bedrock Seepage Slope	1.00 1.00 1.00
059BS: Bolivar-----	50	Very limited Depth to bedrock  Restricted permeability Slope	1.00  0.50 0.04	Very limited Depth to soft bedrock Slope  Seepage	1.00 1.00 0.50
Hector-----	40	Very limited Depth to bedrock  Slope	1.00  0.04	Very limited Depth to hard bedrock Seepage Slope	1.00 1.00 1.00
059CM: Clareson-----	55	Very limited Restricted permeability Depth to bedrock Content of large stones Slope	1.00 1.00 0.81 0.04	Very limited Depth to hard bedrock Slope Content of large stones Seepage	1.00 1.00 0.99 0.32
Eram-----	30	Very limited Restricted permeability Depth to bedrock Depth to saturated zone Slope	1.00 1.00 1.00 0.00	Very limited Depth to soft bedrock Slope	1.00 1.00
059DN: Dennis-----	60	Very limited Restricted permeability Depth to saturated zone	1.00 1.00	Somewhat limited Slope	0.33
Bates-----	30	Very limited Depth to bedrock  Restricted permeability	1.00  0.50	Very limited Depth to soft bedrock Seepage Slope	1.00 0.50 0.33
059EA: Eram-----	55	Very limited Restricted permeability Depth to bedrock  Depth to saturated zone Slope	1.00 1.00 1.00 0.16	Very limited Depth to soft bedrock Depth to saturated zone Slope	1.00 1.00 1.00
Lebo-----	35	Very limited		Very limited	

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Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
059EC: Eram-----	60	Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Restricted permeability	0.50	Slope	1.00
		Slope	0.16	Seepage	0.50
		Very limited Restricted permeability	1.00	Very limited Depth to soft bedrock	1.00
Lula-----	25	Depth to bedrock	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Slope	0.67
		Somewhat limited Depth to bedrock	0.96	Somewhat limited Depth to hard bedrock	0.88
		Restricted permeability	0.50	Seepage	0.50
059LN: Lebo-----	75			Slope	0.33
		Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Restricted permeability	0.50	Seepage	0.50
Rock Outcrop-----	15	Not rated		Not rated	
059MB: Mason-----	90	Very limited Restricted permeability	1.00	Somewhat limited Flooding	0.40
		Flooding	0.40		
059OS: Osage-----	85	Very limited Flooding	1.00	Very limited Flooding	1.00
		Restricted permeability	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
059VB: Verdigris-----	85	Very limited Flooding	1.00	Very limited Flooding	1.00
		Restricted permeability	0.50	Seepage	0.50
087EC: Eudora-----	65	Very limited Flooding	1.00	Very limited Flooding	1.00
		Restricted permeability	0.50	Seepage	0.50
Bismarckgrove-----	20	Very limited Flooding	1.00	Very limited Flooding	1.00
		Restricted permeability	0.50	Seepage	0.50
087FU: Fluvaquents-----	100	Very limited Flooding	1.00	Very limited Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.50	Seepage	0.50
087MU: Muscotah-----	85	Very limited Restricted permeability	1.00	Very limited Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Flooding	0.20
		Flooding	0.20		
091EB: Eudora-----	85	Somewhat limited Restricted permeability	0.50	Somewhat limited Seepage	0.50
		Flooding	0.40	Flooding	0.40
091MC: Morrell-----	85	Somewhat limited Restricted permeability	0.68	Somewhat limited Slope	0.91
				Seepage	0.32
139CM: Clareson-----	55	Very limited		Very limited	

SANITARY FACILITIES--Continued  
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Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Eram-----	30	Restricted permeability	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
		Content of large stones	0.53	Content of large stones	0.88
		Slope	0.04		
		Very limited		Very limited	
139ED: Elmont-----	85	Restricted permeability	1.00	Depth to soft bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
		Depth to saturated zone	1.00		
		Slope	0.00		
		Very limited		Somewhat limited	
139LU: Lula-----	85	Restricted permeability	1.00	Slope	0.67
		Depth to bedrock	0.69	Seepage	0.50
				Depth to soft bedrock	0.26
		Somewhat limited		Somewhat limited	
		Depth to bedrock	0.96	Depth to hard bedrock	0.88
177MF: Martin-----	90	Restricted permeability	0.50	Seepage	0.50
				Slope	0.00
		Very limited		Very limited	
		Restricted permeability	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Slope	1.00
177SW: Stony Steep Land----	60	Slope	0.04		
		Not rated		Not rated	
		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
601KW: Konawa-----	90	Seepage	0.50	Seepage	0.50
		Somewhat limited		Very limited	
		Slope	0.96	Slope	1.00
		Restricted permeability	0.50	Seepage	0.50
601SA: Sarpy-----	55	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Filtering capacity	1.00	Seepage	1.00
				Slope	0.00
		Very limited		Very limited	
Haynie-----	35	Flooding	1.00	Flooding	1.00
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.00
		Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.09
2326: Kenoma-----	90	Depth to saturated zone	1.00		
		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	1.00		
		Depth to saturated zone	1.00		
2540: Leanna-----	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	1.00		
		Depth to saturated zone	1.00		
		Very limited		Very limited	
2797: Morrill, stony-----	85	Restricted permeability	1.00	Slope	1.00
		Slope	0.04	Seepage	0.50
		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
3460: Sibleyville-----	50				
		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00

SANITARY FACILITIES--Continued  
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Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Vinland-----	35	Restricted permeability	0.50	Slope	1.00
		Slope	0.37	Seepage	0.50
		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
3461: Sibleyville, eroded-	85	Slope	0.37	Slope	1.00
				Seepage	0.50
		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
3462: Sibleyville-----	85	Restricted permeability	0.50	Slope	0.67
				Seepage	0.50
		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
3464: Sibleyville-----	50	Restricted permeability	0.50	Slope	0.67
				Seepage	0.50
		Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Slope	0.67
Vinland-----	30	Very limited		Seepage	0.50
		Depth to bedrock	1.00	Very limited	
				Depth to soft bedrock	1.00
				Slope	0.67
3494: Summit-----	85	Very limited		Seepage	0.50
		Restricted permeability	1.00	Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
				Slope	0.09
3495: Summit-----	85	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.91
		Depth to saturated zone	1.00	Depth to saturated zone	0.25
3815: Verdigris-----	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	0.50	Seepage	0.50
3926: Water (less Than 40-	100	Very limited		Very limited	
		Slope	1.00	Slope	1.00
3951: Woodson-----	85	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.00
		Depth to saturated zone	1.00		
AED: Arents, Earthen Dam-	100	Not rated		Not rated	
Be: Basehor-----	50	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.37	Slope	1.00
BOP: Borrow Pits-----	100	Not rated		Not rated	
Et: Eudora-----	90	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Seepage	0.50
		Flooding	0.40	Flooding	0.40
Ev: Eudora-----	60	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Seepage	0.50
		Flooding	0.40	Flooding	0.40
		Very limited		Very limited	
Kimo-----	30	Very limited		Very limited	

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Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Ew: Eudora-----	65	Restricted permeability	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Seepage	0.50
		Flooding	0.40	Flooding	0.40
Kimo-----	25	Somewhat limited Restricted permeability	0.50	Somewhat limited Seepage	0.50
		Flooding	0.40	Flooding	0.40
		Very limited Restricted permeability	1.00	Somewhat limited Depth to saturated zone	0.71
Gm: Gymer-----	85	Depth to saturated zone	1.00	Seepage	0.50
		Flooding	0.40	Flooding	0.40
		Very limited Restricted permeability	1.00	Somewhat limited Seepage	0.50
Gy: Gymer-----	88			Slope	0.00
		Very limited Restricted permeability	1.00	Somewhat limited Slope	0.91
				Seepage	0.50
Ju: Judson-----	85	Somewhat limited Restricted permeability	0.50	Somewhat limited Seepage	0.50
		Flooding	0.40	Flooding	0.40
KA: Kennebec-----	99	Very limited Flooding	1.00	Very limited Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	0.71
		Restricted permeability	0.50	Seepage	0.50
Kb: Kennebec-----	95	Very limited Flooding	1.00	Very limited Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.50	Seepage	0.50
Kc: Kennebec-----	88	Very limited Flooding	1.00	Very limited Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.50	Seepage	0.50
Km: Kimo-----	90	Very limited Restricted permeability	1.00	Very limited Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Seepage	0.50
		Flooding	0.40	Flooding	0.40
Le: Leanna-----	85	Very limited Flooding	1.00	Very limited Flooding	1.00
		Restricted permeability	1.00		
		Depth to saturated zone	1.00		
M-W: Miscellaneous Water-	100	Not rated		Not rated	
Mb: Martin-----	90	Very limited Restricted permeability	1.00	Very limited Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Slope	0.00
Mc: Martin-----	85	Very limited Restricted permeability	1.00	Very limited Depth to saturated zone	1.00

SANITARY FACILITIES--Continued  
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Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Mh: Martin, eroded-----	85	Depth to saturated zone	1.00	Slope	0.67
Mo: Martin-----	40	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.67
Oska-----	30	Very limited Restricted permeability Depth to saturated zone	1.00	Very limited Depth to saturated zone Slope	1.00
Mr: Morrill-----	90	Very limited Restricted permeability Depth to bedrock	1.00	Very limited Depth to hard bedrock Slope	1.00
Ms: Morrill-----	85	Very limited Restricted permeability Slope	1.00	Somewhat limited Slope	0.67
Oe: Oska-----	88	Very limited Restricted permeability Depth to bedrock	0.16	Seepage	0.32
Pb: Pawnee-----	90	Very limited Restricted permeability Depth to saturated zone	1.00	Very limited Depth to hard bedrock Slope	1.00
Pc: Pawnee-----	85	Very limited Restricted permeability Depth to saturated zone	1.00	Somewhat limited Slope	0.00
Ph: Pawnee, eroded-----	90	Very limited Restricted permeability Depth to saturated zone	1.00	Somewhat limited Slope	0.67
QUA: Quarries-----	100	Not rated		Not rated	
Re: Reading-----	90	Somewhat limited Restricted permeability Flooding	0.68	Somewhat limited Flooding	0.40
Ro: River Wash-----	100	Not rated	0.40	Seepage	0.32
Sa: Sand Pit-----	100	Not rated		Not rated	
Sb: Sarpy-----	55	Very limited Flooding Filtering capacity	1.00	Very limited Flooding Seepage	1.00
Eudora-----	45	Very limited Flooding Restricted permeability	1.00	Very limited Flooding Seepage	1.00
Sc: Sharpsburg-----	88	Very limited Restricted permeability	0.50		0.50
Sd: Sharpsburg-----	85	Very limited Restricted permeability	1.00	Somewhat limited Seepage Slope	0.50
					0.09
				Very limited Slope	1.00



SANITARY FACILITIES--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Sh: Sibleyville-----	90	Very limited Depth to bedrock	1.00	Seepage	0.50
		Restricted permeability	0.50	Very limited Depth to soft bedrock	1.00
				Slope	0.67
So: Sibleyville, eroded-	85	Very limited Depth to bedrock	1.00	Seepage	0.50
		Restricted permeability	0.50	Very limited Depth to soft bedrock	1.00
				Slope	0.67
Ss: Sibleyville-----	60	Very limited Depth to bedrock	1.00	Seepage	0.50
		Restricted permeability	0.50	Very limited Depth to soft bedrock	1.00
				Slope	0.67
St: Sibleyville, eroded-	50	Very limited Depth to bedrock	1.00	Seepage	0.50
		Restricted permeability	0.50	Very limited Depth to soft bedrock	1.00
				Slope	0.67
SU: Summit-----	90	Very limited Restricted permeability Depth to saturated zone	1.00 1.00	Seepage	0.50
				Very limited Depth to saturated zone Slope	1.00 0.67
Sv: Sibleyville-----	50	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock	1.00
		Restricted permeability	0.50	Slope	1.00
		Slope	0.37	Seepage	0.50
SVV: Sibleyville-----	45	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock	1.00
		Restricted permeability	0.50	Slope	0.67
				Seepage	0.50
Vinland-----	35	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock	1.00
				Slope	0.67
Sw: Sogn-----	55	Very limited Depth to bedrock	1.00	Very limited Depth to hard bedrock	1.00
		Slope	0.84	Slope	1.00
Vinland-----	30	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock	1.00
		Slope	0.37	Slope	1.00
				Seepage	0.50
Sx: Rock Outcrop-----	60	Not rated		Not rated	
Vinland-----	26	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.50
Tc: Thurman-----	35	Very limited Filtering capacity	1.00	Very limited Seepage	1.00
				Slope	1.00
VA: Verdigris-----	88	Very limited Flooding	1.00	Very limited Flooding	1.00

SANITARY FACILITIES--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Vc: Vinland-----	50	Restricted permeability	0.50	Seepage	0.50
		Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 0.67 0.50
Vh: Vinland-----	60	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 0.67 0.50
		Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 0.67 0.50
Vm: Vinland-----	40	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 1.00 0.50
		Slope	0.37	Seepage	0.50
Martin-----	25	Very limited Restricted permeability	1.00	Very limited Depth to saturated zone	1.00
		Depth to saturated zone Slope	1.00 0.04	Slope	1.00
W: Water (< 40 Acres)--	100	Very limited Slope	1.00	Very limited Slope	1.00
Wc: Wabash-----	88	Very limited Flooding	1.00	Very limited Flooding	1.00
		Restricted permeability Depth to saturated zone	1.00 1.00	Depth to saturated zone	1.00
Wh: Wabash-----	90	Very limited Flooding	1.00	Very limited Flooding	1.00
		Restricted permeability Depth to saturated zone	1.00 1.00	Depth to saturated zone	1.00
Wo: Woodson-----	90	Very limited Restricted permeability	1.00	Not limited	
		Depth to saturated zone	1.00		
Ws: Woodson-----	90	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.00
		Depth to saturated zone	1.00		
Wx: Woodson, eroded----	90	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.00
		Depth to saturated zone	1.00		

SANITARY FACILITIES--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
059BC: Bates-----	90	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
059BD: Bates-----	60	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
Collinsville-----	25	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Seepage	1.00 0.50
059BH: Bates-----	50	Very limited Depth to bedrock Seepage Slope	1.00 1.00 0.00	Very limited Depth to bedrock Slope	1.00 0.00	Very limited Depth to bedrock Slope	1.00 0.00
Collinsville-----	35	Very limited Depth to bedrock Seepage Slope	1.00 1.00 0.16	Very limited Depth to bedrock Slope	1.00 0.16	Very limited Depth to bedrock Seepage Slope	1.00 0.50 0.16
059BS: Bolivar-----	50	Very limited Depth to bedrock Seepage Slope	1.00 1.00 0.04	Very limited Depth to bedrock Slope	1.00 0.04	Very limited Depth to bedrock Slope	1.00 0.04
Hector-----	40	Very limited Depth to bedrock Seepage Slope	1.00 1.00 0.04	Very limited Depth to bedrock Slope	1.00 0.04	Very limited Depth to bedrock Seepage Slope	1.00 0.50 0.04
059CM: Clareson-----	55	Very limited Depth to bedrock Seepage Content of large stones Too clayey Slope	1.00 1.00 0.81 0.50 0.04	Very limited Depth to bedrock Slope	1.00 0.04	Very limited Depth to bedrock Hard to compact Content of large stones Too clayey Slope	1.00 1.00 0.81 0.50 0.04
Eram-----	30	Very limited Depth to saturated zone Depth to bedrock  Too clayey Seepage Slope	1.00 1.00 1.00 1.00 0.00	Very limited Depth to saturated zone Depth to bedrock  Slope	1.00 1.00 0.00	Very limited Depth to bedrock  Depth to saturated zone Too clayey Hard to compact Slope	1.00 1.00 1.00 1.00 0.00
059DN: Dennis-----	60	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Too clayey  Depth to saturated zone Hard to compact	1.00 1.00 1.00
Bates-----	30	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
059EA: Eram-----	55	Very limited Depth to saturated zone Depth to bedrock  Too clayey Seepage Slope	1.00 1.00 1.00 1.00 0.16	Very limited Depth to saturated zone Depth to bedrock  Slope	1.00 1.00 0.16	Very limited Depth to bedrock  Depth to saturated zone Too clayey Hard to compact Slope	1.00 1.00 1.00 1.00 0.16
Lebo-----	35	Very limited Depth to bedrock Seepage Too clayey Slope	1.00 1.00 0.50 0.16	Very limited Depth to bedrock Slope	1.00 0.16	Very limited Depth to bedrock Too clayey Slope	1.00 0.50 0.16
059EC: Eram-----	60	Very limited Depth to saturated zone Depth to bedrock  Too clayey Seepage	1.00 1.00 1.00 1.00	Very limited Depth to saturated zone Depth to bedrock	1.00 1.00	Very limited Depth to bedrock  Depth to saturated zone Too clayey Hard to compact	1.00 1.00 1.00 1.00
Lula-----	25	Very limited Depth to bedrock Seepage Too clayey	1.00 1.00 0.50	Somewhat limited Depth to bedrock	0.88	Very limited Hard to compact Depth to bedrock Too clayey	1.00 0.88 0.50

SANITARY FACILITIES--Continued  
Douglas County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
059LN: Lebo-----	75	Very limited Slope Depth to bedrock Seepage Too clayey 0.50	1.00 1.00 1.00 1.00 0.50	Very limited Slope Depth to bedrock 1.00 1.00	1.00 1.00	Very limited Depth to bedrock Slope Gravel content Too clayey 0.50	1.00 1.00 0.92 0.50
Rock Outcrop-----	15	Not rated		Not rated		Not rated	
059MB: Mason-----	90	Somewhat limited Too clayey Flooding 0.40	0.50 0.40	Somewhat limited Flooding 0.40	0.40	Somewhat limited Too clayey 0.50	0.50
059OS: Osage-----	85	Very limited Flooding Depth to saturated zone Too clayey 1.00	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone 1.00	1.00 1.00	Very limited Depth to saturated zone Too clayey Hard to compact 1.00	1.00 1.00 1.00
059VB: Verdigris-----	85	Very limited Flooding 1.00	1.00	Very limited Flooding 1.00	1.00	Not limited	
087EC: Eudora-----	65	Very limited Flooding 1.00	1.00	Very limited Flooding 1.00	1.00	Not limited	
Bismarckgrove-----	20	Very limited Flooding Too clayey 1.00 0.50	1.00 0.50	Very limited Flooding 1.00	1.00	Somewhat limited Too clayey 0.50	0.50
087FU: Fluvaquents-----	100	Very limited Flooding Depth to saturated zone 1.00	1.00 1.00	Very limited Flooding Depth to saturated zone 1.00	1.00 1.00	Somewhat limited Depth to saturated zone 0.62	0.62
087MU: Muscotah-----	85	Very limited Depth to saturated zone Too clayey Flooding 1.00 1.00 0.20	1.00 1.00 0.20	Very limited Depth to saturated zone Flooding 1.00 0.20	1.00 0.20	Very limited Too clayey Hard to compact Depth to saturated zone 1.00 0.68	1.00 1.00 0.68
091EB: Eudora-----	85	Somewhat limited Flooding 0.40	0.40	Somewhat limited Flooding 0.40	0.40	Not limited	
091MC: Morrill-----	85	Somewhat limited Too clayey 0.50	0.50	Not limited		Somewhat limited Too clayey 0.50	0.50
139CM: Clareson-----	55	Very limited Depth to bedrock Seepage Content of large stones Too clayey Slope 0.50 0.04	1.00 1.00 0.53 0.50 0.04	Very limited Depth to bedrock Slope 1.00 0.04	1.00 0.04	Very limited Depth to bedrock Hard to compact Content of large stones Too clayey Slope 0.50 0.04	1.00 1.00 0.53 0.50 0.04
Eram-----	30	Very limited Depth to saturated zone Depth to bedrock Too clayey Seepage Slope 1.00 1.00 0.00	1.00 1.00 1.00 1.00 0.00	Very limited Depth to saturated zone Depth to bedrock Slope 1.00 1.00 0.00	1.00 1.00 0.00	Very limited Depth to bedrock Depth to saturated zone Too clayey Hard to compact Slope 1.00 1.00 0.00	1.00 1.00 1.00 0.00
139ED: Elmont-----	85	Very limited Depth to bedrock Seepage Too clayey 1.00 1.00 0.50	1.00 1.00 0.50	Somewhat limited Depth to bedrock 0.26	0.26	Somewhat limited Too clayey Depth to bedrock 0.26	0.50 0.26
139LU: Lula-----	85	Very limited Depth to bedrock Seepage Too clayey 1.00 1.00 0.50	1.00 1.00 0.50	Somewhat limited Depth to bedrock 0.88	0.88	Very limited Hard to compact Depth to bedrock Too clayey 0.50	1.00 0.88 0.50
177MF: Martin-----	90	Very limited Depth to saturated zone Too clayey Slope 1.00 1.00 0.04	1.00 1.00 0.04	Very limited Depth to saturated zone Slope 1.00 0.04	1.00 0.04	Very limited Too clayey Hard to compact Depth to saturated zone Slope 1.00 0.87 0.04	1.00 1.00 0.87 0.04

SANITARY FACILITIES--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
177SW: Stony Steep Land----	60	Not rated		Not rated		Not rated	
Vinland-----	26	Very limited Depth to bedrock Slope Seepage Too clayey	1.00 1.00 1.00 0.50	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to bedrock Slope Too clayey	1.00 1.00 0.50
601KW: Konawa-----	90	Somewhat limited Slope Too clayey	0.96 0.50	Somewhat limited Slope	0.96	Somewhat limited Slope Too clayey	0.96 0.50
601SA: Sarpy-----	55	Very limited Flooding Seepage Too Sandy	1.00 1.00 1.00	Very limited Flooding Seepage	1.00 1.00	Very limited Too Sandy Seepage	1.00 1.00
Haynie-----	35	Very limited Flooding	1.00	Very limited Flooding	1.00	Not limited	
2326: Kenoma-----	90	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Too clayey Hard to compact	1.00 1.00 1.00
2540: Leanna-----	85	Very limited Flooding  Depth to saturated zone Too clayey	1.00  1.00 1.00	Very limited Flooding  Depth to saturated zone	1.00  1.00	Very limited Depth to saturated zone Too clayey Hard to compact	1.00  1.00 1.00
2797: Morrill, stony-----	85	Somewhat limited Too clayey Slope	0.50 0.04	Somewhat limited Slope	0.04	Somewhat limited Too clayey Slope	0.50 0.04
3460: Sibleyville-----	50	Very limited Depth to bedrock Seepage Slope	1.00 1.00 0.37	Very limited Depth to bedrock Slope	1.00 0.37	Very limited Depth to bedrock Slope	1.00 0.37
Vinland-----	35	Very limited Depth to bedrock Seepage Slope	1.00 1.00 0.37	Very limited Depth to bedrock Slope	1.00 0.37	Very limited Depth to bedrock Slope	1.00 0.37
3461: Sibleyville, eroded-	85	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
3462: Sibleyville-----	85	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
3464: Sibleyville-----	50	Very limited Seepage	1.00	Not limited		Not limited	
Vinland-----	30	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
3494: Summit-----	85	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Too clayey  Hard to compact Depth to saturated zone	1.00  1.00 0.47
3495: Summit-----	85	Very limited Too clayey  Depth to saturated zone	1.00  1.00	Somewhat limited Depth to saturated zone	0.75	Very limited Too clayey  Hard to compact Depth to saturated zone	1.00  1.00 0.86
3815: Verdigris-----	85	Very limited Flooding	1.00	Very limited Flooding	1.00	Not limited	
3926: Water (less Than 40-	100	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
3951: Woodson-----	85	Very limited		Very limited		Very limited	

SANITARY FACILITIES--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
		Depth to saturated zone Too clayey	1.00 1.00	Depth to saturated zone	1.00	Depth to saturated zone Too clayey Hard to compact	1.00 1.00 1.00
AED: Arents, Earthen Dam-	100	Not rated		Not rated		Not rated	
Be: Basehor-----	50	Very limited Depth to bedrock Seepage Slope	1.00 1.00 0.37	Very limited Depth to bedrock Slope	1.00 0.37	Very limited Depth to bedrock Seepage Slope	1.00 0.50 0.37
BOP: Borrow Pits-----	100	Not rated		Not rated		Not rated	
Et: Eudora-----	90	Somewhat limited Flooding	0.40	Somewhat limited Flooding	0.40	Not limited	
Ev: Eudora-----	60	Somewhat limited Flooding	0.40	Somewhat limited Flooding	0.40	Not limited	
Kimo-----	30	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Somewhat limited Depth to saturated zone	0.86
Ew: Eudora-----	65	Somewhat limited Flooding	0.40	Somewhat limited Flooding	0.40	Not limited	
Kimo-----	25	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Not limited	
Gm: Gymer-----	85	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Gy: Gymer-----	88	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Ju: Judson-----	85	Somewhat limited Too clayey Flooding	0.50 0.40	Somewhat limited Flooding	0.40	Somewhat limited Too clayey	0.50
KA: Kennebec-----	99	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Not limited	
Kb: Kennebec-----	95	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Not limited	
Kc: Kennebec-----	88	Very limited Flooding Depth to saturated zone Too clayey	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone	1.00 1.00	Somewhat limited Too clayey	0.50
Km: Kimo-----	90	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Somewhat limited Depth to saturated zone	0.86
Le: Leanna, drained----	85	Very limited Flooding Depth to saturated zone Too clayey	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Too clayey Depth to saturated zone Hard to compact	1.00 1.00 1.00
M-W: Miscellaneous Water-	100	Not rated		Not rated		Not rated	
Mb: Martin-----	90	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Too clayey  Hard to compact Depth to saturated zone	1.00  1.00 0.86
Mc: Martin-----	85	Very limited		Very limited		Very limited	

SANITARY FACILITIES--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	1.00
		Too clayey	1.00			Hard to compact	1.00
						Depth to saturated zone	0.86
Mh: Martin, eroded-----	85	Very limited Too clayey	1.00	Not limited		Very limited Too clayey	1.00
Mo: Martin-----	40	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Hard to compact	1.00
		Too clayey	1.00			Depth to saturated zone	0.86
Oska-----	30	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
		Too clayey	1.00			Too clayey	1.00
		Seepage	1.00			Hard to compact	1.00
Mr: Morrill-----	90	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Ms: Morrill-----	85	Somewhat limited Too clayey	0.50	Somewhat limited Slope	0.16	Somewhat limited Too clayey	0.50
		Slope	0.16			Slope	0.16
Oe: Oska-----	88	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
		Too clayey	1.00			Too clayey	1.00
		Seepage	1.00			Hard to compact	1.00
Pb: Pawnee-----	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
						Hard to compact	1.00
Pc: Pawnee-----	85	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
						Hard to compact	1.00
Ph: Pawnee, eroded-----	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
						Hard to compact	1.00
QUA: Quarries-----	100	Not rated		Not rated		Not rated	
Re: Reading-----	90	Somewhat limited Too clayey	0.50	Somewhat limited Flooding	0.40	Somewhat limited Too clayey	0.50
		Flooding	0.40				
Ro: River Wash-----	100	Not rated		Not rated		Not rated	
Sa: Sand Pit-----	100	Not rated		Not rated		Not rated	
Sb: Sarpy-----	55	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Too Sandy	1.00
		Seepage	1.00	Seepage	1.00	Seepage	1.00
		Too Sandy	1.00				
Eudora-----	45	Very limited Flooding	1.00	Very limited Flooding	1.00	Not limited	
Sc: Sharpsburg-----	88	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Sd: Sharpsburg-----	85	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Sh: Sibleyville-----	90	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
		Seepage	1.00				
So: Sibleyville, eroded-	85	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
		Seepage	1.00				
Ss: Sibleyville-----	60	Very limited		Very limited		Very limited	

SANITARY FACILITIES--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
St: Sibleyville, eroded-	50	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00				
SU: Summit-----	90	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
Sv: Sibleyville-----	50	Seepage	1.00				
		Very limited		Very limited		Very limited	
SVV: Sibleyville-----	45	Depth to	1.00	Depth to	1.00	Too clayey	1.00
		saturated zone	1.00	saturated zone			
Sw: Sogn-----	55	Too clayey				Hard to compact	1.00
			0.86			Depth to	0.86
Sx: Rock Outcrop-----	60	Depth to bedrock	1.00	Depth to bedrock	1.00	Saturated zone	
		Seepage	1.00	Slope	0.37	Depth to bedrock	1.00
Tc: Thurman-----	35	Slope	0.37			Slope	0.37
		Very limited		Very limited		Very limited	
VA: Verdigris-----	88	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00				
Vc: Vinland-----	50	Too clayey		Very limited		Very limited	
			0.50	Depth to bedrock	1.00	Depth to bedrock	1.00
Vh: Vinland-----	60	Depth to bedrock	1.00	Slope	0.37	Too clayey	0.50
		Seepage	1.00			Depth to bedrock	1.00
Vm: Vinland-----	40	Too clayey				Too clayey	0.50
			0.50				
W: Water (< 40 Acres)--	100	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00				
Wc: Wabash-----	88	Too clayey		Very limited		Very limited	
			0.37	Flooding	1.00	Depth to	1.00
Martin-----	25	Slope	0.37			saturated zone	0.04
		Very limited		Very limited		Hard to compact	1.00
W: Water (< 40 Acres)--	100	Depth to	1.00	Depth to	1.00	Depth to	0.86
		saturated zone	1.00	saturated zone	0.04	saturated zone	0.04
Wc: Wabash-----	88	Too clayey		Slope		Slope	
			0.04				
W: Water (< 40 Acres)--	100	Depth to	1.00	Depth to	1.00	Depth to	1.00
		saturated zone	1.00	saturated zone	1.00	saturated zone	1.00
Wc: Wabash-----	88	Too clayey		Flooding	1.00	Depth to	1.00
			1.00			saturated zone	1.00



SANITARY FACILITIES--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Wh: Wabash-----	90	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	1.00
		Too clayey	1.00			Hard to compact	1.00
		Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	1.00
Wo: Woodson-----	90	Too clayey	1.00			Hard to compact	1.00
		Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Too clayey	1.00			Too clayey	1.00
Ws: Woodson-----	90					Hard to compact	1.00
		Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Too clayey	1.00			Too clayey	1.00
Wx: Woodson, eroded----	90					Hard to compact	1.00
		Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00

# AGRICULTURAL WASTE MANAGEMENT Douglas County, Kansas

The nature of the soil is also important in the application of organic wastes and wastewater to land as fertilizers and irrigation; it is also important when the soil is used as a medium for treatment and disposal of these wastes. Favorable soil properties are required to prevent environmental damage.

The use of organic wastes and wastewater as production resources will result in energy conservation, prevent the waste of these important resources, and prevent problems associated with their disposal. Where disposal is the goal, and a maximum amount is disposed in a minimum area to hold costs to a minimum, risk of environmental damage is the principal constraint. Where the reuse goal is pursued, and a minimum amount is applied to a maximum area to obtain the greatest benefit, environmental damage is unlikely.

Interpretations developed for waste management may include ratings for (1) manure and food processing wastes; (2) municipal sewage sludge; (3) irrigation use of wastewater; or (4) treatment of wastewater by the slow rate process, overland flow process, or rapid infiltration process. If available, these should be located in this subsection.

Soil properties are important considerations in areas where soils are used as sites for the treatment and disposal of organic waste and wastewater. Selection of soils with properties that favor waste management can help to prevent environmental damage.

The Ag-Waste tables show the degree and kind of soil limitations affecting the treatment of agricultural waste, including municipal and food-processing wastewater and effluent from lagoons or storage ponds. Municipal wastewater is the waste stream from a municipality. It contains domestic waste and may contain industrial waste. It may have received primary or secondary treatment. It is rarely untreated sewage. Food-processing wastewater results from the preparation of fruits, vegetables, milk, cheese, and meats for public consumption. In places it is high in content of sodium and chloride. In the context of these tables, the effluent in lagoons and storage ponds is from facilities used to treat or store food-processing wastewater or domestic or animal waste. Domestic and food-processing wastewater is very dilute, and the effluent from the facilities that treat or store it commonly is very low in content of carbonaceous and nitrogenous material; the content of nitrogen commonly ranges from 10 to 30 milligrams per liter. The wastewater from animal waste treatment lagoons or storage ponds, however, has much higher concentrations of these materials, mainly because the manure has not been diluted as much as the domestic waste. The content of nitrogen in this wastewater generally ranges from 50 to 2,000 milligrams per liter. When wastewater is applied, checks should be made to ensure that nitrogen, phosphorus, heavy metals, and salts are not added in excessive amounts.

The ratings in the tables are for waste management systems that not only dispose of and treat organic waste or wastewater but also are beneficial to crops (application of manure and food-processing waste, application of sewage sludge, and disposal of wastewater by irrigation) and for waste management systems that are designed only for the purpose of wastewater disposal and treatment (overland flow of wastewater, rapid infiltration of wastewater, and slow rate treatment of wastewater).

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect agricultural waste management. Not limited indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. Slightly limited indicates that the soil has features that are generally favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. Somewhat limited indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. Very limited indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Application of manure and food-processing waste not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in the soils where the material is applied. Manure is the excrement of livestock and poultry, and food-processing waste is damaged fruit and vegetables and the peelings, stems, leaves, pits, and soil particles removed in food preparation. The manure and food-processing waste are either solid, slurry, or liquid. Their nitrogen content varies. A high content of nitrogen limits the application rate. Toxic or otherwise dangerous wastes, such as those mixed with the lye used in food processing, are not considered in the ratings.

The ratings are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the waste is applied, and the method by which the waste is applied. The properties that affect absorption include permeability, depth to a water table, ponding, the sodium adsorption ratio, depth to bedrock or a cemented pan, and available water capacity. The properties that affect plant growth and microbial activity include reaction, the sodium adsorption ratio, salinity, and bulk density. The wind erodibility group, the soil erodibility factor K, and slope are considered in estimating the likelihood that wind erosion or water erosion will transport the waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder the application of waste. Permanently frozen soils are unsuitable for waste treatment.

Application of sewage sludge not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in the soils where the material is applied. In the context of this table, sewage sludge is the residual product of the treatment of municipal sewage. The solid component consists mainly of cell mass, primarily bacteria cells that developed during secondary treatment and have incorporated soluble organics into their own bodies. The sludge has small amounts of sand, silt, and other solid debris. The content of nitrogen varies. Some sludge has constituents that are toxic to plants or hazardous to the food chain, such as heavy metals and exotic organic compounds, and should be analyzed chemically prior to use.

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The content of water in the sludge ranges from about 98 percent to less than 40 percent. The sludge is considered liquid if it is more than about 90 percent water, slurry if it is about 50 to 90 percent water, and solid if it is less than about 50 percent water.

The ratings in the table are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the sludge is applied, and the method by which the sludge is applied. The properties that affect absorption, plant growth, and microbial activity include permeability, depth to a water table, ponding, the sodium adsorption ratio, depth to bedrock or a cemented pan, available water capacity, reaction, salinity, and bulk density. The wind erodibility group, the soil erodibility factor K, and slope are considered in estimating the likelihood that wind erosion or water erosion will transport the waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder the application of sludge. Permanently frozen soils are unsuitable for waste treatment.

Disposal of wastewater by irrigation not only disposes of municipal wastewater and wastewater from food-processing plants, lagoons, and storage ponds but also can improve crop production by increasing the amount of water available to crops. The ratings in the table are based on the soil properties that affect the design, construction, management, and performance of the irrigation system. The properties that affect design and management include the sodium adsorption ratio, depth to a water table, ponding, available water capacity, permeability, slope, and flooding. The properties that affect construction include stones, cobbles, depth to bedrock or a cemented pan, depth to a water table, and ponding.

The properties that affect performance include depth to bedrock or a cemented pan, bulk density, the sodium adsorption ratio, salinity, reaction, and the cation-exchange capacity, which is used to estimate the capacity of a soil to adsorb heavy metals. Permanently frozen soils are not suitable for disposal of wastewater by irrigation.

See the National Soil Handbook, September 1992, Part 620, for criteria used in rating soils for sanitary facilities and waste management.

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(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
059BC: Bates-----	90	Somewhat limited Depth to bedrock Too acid	0.42 0.11	Somewhat limited Depth to bedrock Too acid	0.42 0.42	Somewhat limited Depth to bedrock Too acid Too steep for surface application	0.42 0.42 0.00
059BD: Bates-----	60	Somewhat limited Too acid Depth to bedrock	0.11 0.01	Somewhat limited Too acid Depth to bedrock	0.42 0.01	Somewhat limited Too acid Too steep for surface application Depth to bedrock	0.42 0.31 0.01
Collinsville-----	25	Very limited Depth to bedrock Droughty Runoff limitation Too acid  Filtering capacity	1.00 1.00 0.40 0.22 0.00	Very limited Depth to bedrock Droughty Too acid Filtering capacity	1.00 1.00 0.77 0.00	Very limited Depth to bedrock Droughty Too acid Too steep for surface application Filtering capacity	1.00 1.00 0.77 0.31 0.00
059BH: Bates-----	50	Somewhat limited Depth to bedrock  Too acid Slope	0.16 0.11 0.00	Somewhat limited Too acid  Depth to bedrock Slope	0.42 0.16 0.00	Very limited Too steep for surface application Too acid Depth to bedrock Too steep for sprinkler application	1.00 0.42 0.16 0.10
Collinsville-----	35	Very limited Depth to bedrock Droughty Runoff limitation  Too acid Slope	1.00 1.00 0.40 0.22 0.16	Very limited Depth to bedrock Droughty Too acid  Slope Filtering capacity	1.00 1.00 0.77 0.16 0.00	Very limited Depth to bedrock Droughty Too steep for surface application Too acid Too steep for sprinkler application	1.00 1.00 1.00 0.77 0.39
059BS: Bolivar-----	50	Somewhat limited Too acid  Depth to bedrock Droughty  Slope	0.18 0.16 0.07 0.04	Somewhat limited Too acid  Depth to bedrock Droughty  Slope	0.67 0.16 0.07 0.04	Very limited Too steep for surface application Too acid Too steep for sprinkler application Depth to bedrock Droughty	1.00 0.67 0.22 0.16 0.07
Hector-----	40	Very limited Depth to bedrock Droughty Runoff limitation  Too acid Slope	1.00 1.00 0.40 0.11 0.04	Very limited Droughty Depth to bedrock Too acid  Slope Filtering capacity	1.00 1.00 0.42 0.04 0.00	Very limited Droughty Depth to bedrock Too steep for surface application Too acid Too steep for sprinkler application	1.00 1.00 1.00 0.42 0.22
059CM: Clareson-----	55	Very limited Restricted permeability Droughty  Depth to bedrock Slope	1.00 0.99 0.80 0.04	Very limited Restricted permeability Droughty  Depth to bedrock Slope	1.00 0.99 0.80 0.04	Very limited Restricted permeability Too steep for surface application Droughty Depth to bedrock Too steep for sprinkler application	1.00 1.00 0.99 0.80 0.22
Eram-----	30	Very limited		Very limited		Very limited	

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Map symbol and soil name	Pct of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
059DN: Dennis-----	60	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Too acid	0.03	Too acid	0.14	Too steep for surface application	1.00
		Droughty	0.02	Droughty	0.02	Too acid	0.14
		Depth to bedrock	0.01	Depth to bedrock	0.01	Too steep for sprinkler application	0.10
		Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Too acid	0.18	Too acid	0.67	Too acid	0.67
						Too steep for surface application	0.08
		Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to bedrock	0.16	Too acid	0.42	Too acid	0.42
059EA: Eram-----	30	Too acid	0.11	Depth to bedrock	0.16	Depth to bedrock	0.16
						Too steep for surface application	0.08
		Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Slope	0.16	Slope	0.16	Too steep for surface application	1.00
		Too acid	0.03	Too acid	0.14	Too steep for sprinkler application	0.39
		Droughty	0.02	Droughty	0.02	Too acid	0.14
		Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.65	Depth to bedrock	0.65	Too steep for surface application	1.00
		Slope	0.16	Slope	0.16	Depth to bedrock	0.65
		Droughty	0.04	Droughty	0.04	Too steep for sprinkler application	0.39
059EC: Eram-----	60					Droughty	0.04
		Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Too acid	0.03	Too acid	0.14	Too steep for surface application	0.31
		Droughty	0.02	Droughty	0.02	Too acid	0.14
		Depth to bedrock	0.01	Depth to bedrock	0.01	Droughty	0.02
		Somewhat limited		Somewhat limited		Somewhat limited	
		Too acid	0.03	Too acid	0.14	Too acid	0.14
						Too steep for surface application	0.08
		Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
059LN: Lebo-----	75	Cobble content	1.00	Cobble content	1.00	Too steep for sprinkler application	1.00
		Droughty	0.96	Droughty	0.96	Cobble content	1.00
		Depth to bedrock	0.65	Depth to bedrock	0.65	Droughty	0.96
		Not rated		Not rated		Depth to bedrock	0.65
						Not rated	
Rock Outcrop-----	15						

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Map symbol and soil name	Pct of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
059MB: Mason-----	90	Somewhat limited Restricted permeability Too acid	0.30 0.02	Somewhat limited Flooding  Restricted permeability Too acid	0.40 0.22 0.07	Somewhat limited Restricted permeability Too acid	0.22 0.07
059OS: Osage-----	85	Very limited Restricted permeability Depth to saturated zone Flooding Runoff limitation Too acid	1.00 1.00 0.60 0.40 0.02	Very limited Restricted permeability Depth to saturated zone Flooding Too acid	1.00 1.00 1.00 0.07	Very limited Restricted permeability Depth to saturated zone Flooding Too acid	1.00 1.00 0.60 0.07
059VB: Verdigris-----	85	Somewhat limited Flooding	0.60	Very limited Flooding	1.00	Somewhat limited Flooding	0.60
087EC: Eudora-----	65	Somewhat limited Flooding Filtering capacity	0.60 0.00	Very limited Flooding Filtering capacity	1.00 0.00	Somewhat limited Flooding Filtering capacity	0.60 0.00
Bismarckgrove-----	20	Somewhat limited Flooding Filtering capacity	0.60 0.00	Very limited Flooding Filtering capacity	1.00 0.00	Somewhat limited Flooding Filtering capacity	0.60 0.00
087FU: Fluvaquents-----	100	Very limited Flooding Low adsorption Depth to saturated zone	1.00 1.00 0.93	Very limited Flooding Low adsorption Depth to saturated zone	1.00 1.00 0.93	Very limited Low adsorption Flooding Depth to saturated zone	1.00 1.00 0.93
087MU: Muscotah-----	85	Very limited Restricted permeability Depth to saturated zone Runoff limitation Too acid	1.00 0.95 0.40 0.14	Very limited Restricted permeability Depth to saturated zone Too acid Flooding	1.00 0.95 0.55 0.20	Very limited Restricted permeability Depth to saturated zone Too acid	1.00 0.95 0.55
091EB: Eudora-----	85	Not limited		Somewhat limited Flooding	0.40	Not limited	
091MC: Morrill-----	85	Somewhat limited Restricted permeability  Too acid	0.30 0.02	Somewhat limited Restricted permeability  Too acid	0.22 0.07	Somewhat limited Too steep for surface application Restricted permeability Too acid Too steep for sprinkler application	0.66 0.22 0.07 0.00
139CM: Clareson-----	55	Very limited Restricted permeability  Droughty Depth to bedrock Slope	1.00 0.99 0.90 0.04	Somewhat limited Droughty  Restricted permeability Depth to bedrock Slope	0.99 0.96 0.90 0.04	Very limited Too steep for surface application Droughty Restricted permeability Depth to bedrock Too steep for sprinkler application	1.00 0.99 0.96 0.90 0.22
Eram-----	30	Very limited Depth to saturated zone Restricted permeability	1.00 1.00	Very limited Depth to saturated zone Restricted permeability	1.00 1.00	Very limited Depth to saturated zone Restricted permeability	1.00 1.00

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Map symbol and soil name	Pct of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
139ED: Elmont-----	85	Depth to bedrock	0.65	Depth to bedrock	0.65	Too steep for surface application	1.00
		Droughty	0.60	Droughty	0.60	Depth to bedrock	0.65
		Too acid	0.03	Too acid	0.14	Droughty	0.60
		Somewhat limited Restricted permeability	0.30	Somewhat limited Restricted permeability	0.22	Somewhat limited Too steep for surface application	0.31
139LU: Lula-----	85	Too acid	0.02	Too acid	0.07	Restricted permeability Too acid	0.22
						Too acid	0.07
177MF: Martin-----	90	Somewhat limited Too acid	0.03	Somewhat limited Too acid	0.14	Somewhat limited Too acid	0.14
		Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too steep for surface application	1.00
		Slope	0.04	Too acid	0.14	Depth to saturated zone	1.00
177SW: Stony Steep Land----	60	Too acid	0.03	Slope	0.04	Too steep for sprinkler application	0.22
						Too acid	0.14
Vinland-----	26	Not rated		Not rated		Not rated	
		Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
		Droughty	0.89	Droughty	0.89	Too steep for sprinkler application	1.00
601KW: Konawa-----	90	Runoff limitation	0.40			Droughty	0.89
		Somewhat limited Slope	0.96	Somewhat limited Slope	0.96	Very limited Too steep for surface application	1.00
		Filtering capacity	0.00	Filtering capacity	0.00	Too steep for sprinkler application	0.97
						Filtering capacity	0.00
601SA: Sarpy-----	55	Very limited Filtering capacity	1.00	Very limited Flooding	1.00	Very limited Filtering capacity	1.00
		Droughty	0.65	Filtering capacity Droughty	1.00	Droughty	0.65
		Flooding Leaching limitation	0.60		0.65	Flooding	0.60
		0.45					
Haynie-----	35	Somewhat limited Flooding	0.60	Very limited Flooding	1.00	Somewhat limited Flooding	0.60
2326: Kenoma-----	90	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Runoff limitation	0.40	Too acid	0.85	Too acid	0.85
		Too acid	0.27			Too steep for surface application	0.00
2540: Leanna-----	85	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00

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Map symbol and soil name	Pct of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2797: Morrill, stony-----	85	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	0.60	Flooding	1.00	Flooding	0.60
		Runoff limitation	0.40	Too acid	0.42	Too acid	0.42
		Too acid	0.11				
		Somewhat limited Restricted permeability	0.30	Somewhat limited Restricted permeability	0.22	Very limited Too steep for surface application	1.00
		Slope	0.04	Too acid	0.07	Restricted permeability	0.22
3460: Sibleyville-----	50	Too acid	0.02	Slope	0.04	Too steep for sprinkler application	0.22
						Too acid	0.07
3460: Sibleyville-----	50	Somewhat limited Depth to bedrock	0.71	Somewhat limited Depth to bedrock	0.71	Very limited Too steep for surface application	1.00
						Depth to bedrock	0.71
		Droughty	0.43	Droughty	0.43	Too steep for sprinkler application	0.59
		Slope	0.37	Slope	0.37	Droughty	0.43
Vinland-----	35	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
		Droughty	0.95	Droughty	0.95	Too steep for surface application	1.00
						Droughty	0.95
		Runoff limitation	0.40	Slope	0.37	Too steep for sprinkler application	0.59
3461: Sibleyville, eroded-	85	Slope	0.37				
3461: Sibleyville, eroded-	85	Somewhat limited Depth to bedrock	0.71	Somewhat limited Depth to bedrock	0.71	Somewhat limited Depth to bedrock	0.71
		Droughty	0.53	Droughty	0.53	Droughty	0.53
						Too steep for surface application	0.31
3462: Sibleyville-----	85						
		Somewhat limited Depth to bedrock	0.71	Somewhat limited Depth to bedrock	0.71	Somewhat limited Depth to bedrock	0.71
		Droughty	0.43	Droughty	0.43	Droughty	0.43
3464: Sibleyville-----	50					Too steep for surface application	0.31
		Somewhat limited Droughty	0.43	Somewhat limited Droughty	0.43	Somewhat limited Droughty	0.43
						Too steep for surface application	0.31
Vinland-----	30						
		Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
		Droughty	0.95	Droughty	0.95	Droughty	0.95
3494: Summit-----	85	Runoff limitation	0.40			Too steep for surface application	0.31
3494: Summit-----	85	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
		Depth to saturated zone	0.86	Depth to saturated zone	0.86	Depth to saturated zone	0.86
						Too steep for surface application	0.00
3495: Summit-----	85						
		Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00



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Map symbol and soil name	Pct of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
						Too steep for surface application	0.66
						Too steep for sprinkler application	0.00
3815: Verdigris-----	85	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
3926: Water (less Than 40-	100	Very limited Slope	1.00	Very limited Low adsorption	1.00	Very limited Low adsorption	1.00
		Low adsorption	1.00	Slope	1.00	Too steep for surface application	1.00
						Too steep for sprinkler application	1.00
3951: Woodson-----	85	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Runoff limitation	0.40	Too acid	0.14	Too acid	0.14
		Too acid	0.03				
AED: Arents, Earthen Dam-	100	Not rated		Not rated		Not rated	
Be: Basehor-----	50	Very limited Depth to bedrock	1.00	Very limited Droughty	1.00	Very limited Droughty	1.00
		Droughty	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Runoff limitation	0.40	Too acid	0.42	Too steep for surface application	1.00
						Too steep for sprinkler application	0.59
		Slope	0.37	Slope	0.37	Too acid	0.42
		Too acid	0.11	Filtering capacity	0.00		
BOP: Borrow Pits-----	100	Not rated		Not rated		Not rated	
Et: Eudora-----	90	Not limited		Somewhat limited Flooding	0.40	Not limited	
Ev: Eudora-----	60	Not limited		Somewhat limited Flooding	0.40	Not limited	
Kimo-----	30	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Ew: Eudora-----	65	Somewhat limited Filtering capacity	0.00	Somewhat limited Flooding	0.40	Somewhat limited Filtering capacity	0.00
				Filtering capacity	0.00		
Kimo-----	25	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
Gm: Gymer-----	85	Somewhat limited Restricted permeability	0.30	Somewhat limited Too acid	0.42	Somewhat limited Too acid	0.42
		Too acid	0.11	Restricted permeability	0.22	Restricted permeability	0.22
Gy: Gymer-----	88	Somewhat limited		Somewhat limited		Somewhat limited	

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Map symbol and soil name	Pct of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
		Restricted permeability	0.30	Too acid	0.42	Too steep for surface application	0.66
		Too acid	0.11	Restricted permeability	0.22	Too acid	0.42
						Restricted permeability Too steep for sprinkler application	0.22 0.00
Ju: Judson-----	85	Not limited		Somewhat limited Flooding	0.40	Not limited	
KA: Kennebec-----	99	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Kb: Kennebec-----	95	Somewhat limited Flooding Depth to saturated zone	0.60 0.09	Very limited Flooding Depth to saturated zone	1.00 0.09	Somewhat limited Flooding Depth to saturated zone	0.60 0.09
Kc: Kennebec-----	88	Very limited Flooding Depth to saturated zone	1.00 0.09	Very limited Flooding Depth to saturated zone	1.00 0.09	Very limited Flooding Depth to saturated zone	1.00 0.09
Km: Kimo-----	90	Very limited Restricted permeability Depth to saturated zone	1.00 1.00	Very limited Restricted permeability Depth to saturated zone Flooding	1.00 1.00 0.40	Very limited Restricted permeability Depth to saturated zone	1.00 1.00
Le: Leanna-----	85	Very limited Restricted permeability Depth to saturated zone Flooding	1.00 1.00 0.60	Very limited Restricted permeability Flooding Depth to saturated zone Too acid	1.00 1.00 1.00 0.42	Very limited Restricted permeability Depth to saturated zone Flooding Too acid	1.00 1.00 0.60 0.42
M-W: Miscellaneous Water-	100	Not rated		Not rated		Not rated	
Mb: Martin-----	90	Very limited Restricted permeability Depth to saturated zone Too acid	1.00 1.00 0.03	Very limited Restricted permeability Depth to saturated zone Too acid	1.00 1.00 0.14	Very limited Restricted permeability Depth to saturated zone Too acid	1.00 1.00 0.14
Mc: Martin-----	85	Very limited Restricted permeability Depth to saturated zone Too acid	1.00 1.00 0.03	Very limited Restricted permeability Depth to saturated zone Too acid	1.00 1.00 0.14	Very limited Restricted permeability Depth to saturated zone Too steep for surface application Too acid	1.00 1.00 0.31 0.14
Mh: Martin, eroded-----	85	Very limited Restricted permeability Too acid	1.00 0.03	Very limited Restricted permeability Too acid	1.00 0.14	Very limited Restricted permeability Too steep for surface application Too acid	1.00 0.31 0.14
Mo: Martin-----	40	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00

AGRICULTURAL WASTE MANAGEMENT--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Oska-----	30	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too acid	0.03	Too acid	0.14	Too steep for surface application	0.31
		Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Too acid	0.14
		Too acid	0.03	Too acid	0.14	Restricted permeability	1.00
Mr: Morrill-----	90	Depth to bedrock	0.01	Depth to bedrock	0.01	Too steep for surface application	0.31
		Somewhat limited Restricted permeability	0.30	Somewhat limited Restricted permeability	0.22	Too acid	0.14
		Too acid	0.02	Too acid	0.07	Depth to bedrock	0.01
						Too steep for surface application	0.31
Ms: Morrill-----	85	Depth to bedrock	0.01	Depth to bedrock	0.01	Restricted permeability	1.00
		Somewhat limited Restricted permeability	0.30	Somewhat limited Restricted permeability	0.22	Too steep for surface application	0.31
		Slope	0.16	Slope	0.16	Too acid	0.07
		Too acid	0.02	Too acid	0.07	Too steep for surface application	0.31
Oe: Oska-----	88	Depth to bedrock	0.01	Depth to bedrock	0.01	Restricted permeability	1.00
		Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Too steep for surface application	0.31
		Too acid	0.03	Too acid	0.14	Too acid	0.07
						Depth to bedrock	0.01
Pb: Pawnee-----	90	Depth to bedrock	0.01	Depth to bedrock	0.01	Depth to bedrock	0.01
		Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Runoff limitation	0.40				
Pc: Pawnee-----	85	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Runoff limitation	0.40			Too steep for surface application	0.31
Ph: Pawnee, eroded-----	90	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Runoff limitation	0.40			Too steep for surface application	0.31
QUA: Quarries-----	100	Not rated		Not rated		Not rated	
Re: Reading-----	90	Somewhat limited Too acid	0.03	Somewhat limited Flooding Too acid	0.40 0.14	Somewhat limited Too acid	0.14
Ro: River Wash-----	100	Not rated		Not rated		Not rated	

AGRICULTURAL WASTE MANAGEMENT--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Sa: Sand Pit-----	100	Not rated		Not rated		Not rated	
Sb: Sarpy-----	55	Very limited Filtering capacity Droughty	1.00 0.65	Very limited Flooding Filtering capacity Droughty	1.00 1.00 0.65	Very limited Filtering capacity Droughty	1.00 0.65
		Flooding Leaching limitation	0.60 0.45			Flooding	0.60
Eudora-----	45	Somewhat limited Flooding Filtering capacity	0.60 0.00	Very limited Flooding Filtering capacity	1.00 0.00	Somewhat limited Flooding Filtering capacity	0.60 0.00
Sc: Sharpsburg-----	88	Somewhat limited Restricted permeability Too acid	0.30 0.02	Somewhat limited Restricted permeability Too acid	0.22 0.07	Somewhat limited Restricted permeability Too acid Too steep for surface application	0.22 0.07 0.00
Sd: Sharpsburg-----	85	Somewhat limited Restricted permeability Too acid	0.30 0.02	Somewhat limited Restricted permeability Too acid	0.22 0.07	Somewhat limited Too steep for surface application Restricted permeability Too acid Too steep for sprinkler application	0.91 0.22 0.07 0.02
Sh: Sibleyville-----	90	Somewhat limited Depth to bedrock Droughty	0.71 0.43	Somewhat limited Depth to bedrock Droughty	0.71 0.43	Somewhat limited Depth to bedrock Droughty Too steep for surface application	0.71 0.43 0.31
So: Sibleyville, eroded-	85	Somewhat limited Depth to bedrock Droughty	0.71 0.53	Somewhat limited Depth to bedrock Droughty	0.71 0.53	Somewhat limited Depth to bedrock Droughty Too steep for surface application	0.71 0.53 0.31
Ss: Sibleyville-----	60	Somewhat limited Droughty Depth to bedrock	0.43 0.29	Somewhat limited Droughty Depth to bedrock	0.43 0.29	Somewhat limited Droughty Too steep for surface application Depth to bedrock	0.43 0.31 0.29
St: Sibleyville, eroded-	50	Somewhat limited Depth to bedrock Droughty	0.71 0.43	Somewhat limited Depth to bedrock Droughty	0.71 0.43	Somewhat limited Depth to bedrock Droughty Too steep for surface application	0.71 0.43 0.31
SU: Summit-----	90	Very limited Restricted permeability Depth to saturated zone	1.00 1.00	Very limited Restricted permeability Depth to saturated zone	1.00 1.00	Very limited Restricted permeability Depth to saturated zone Too steep for surface application	1.00 1.00 0.31
Sv: Sibleyville-----	50	Somewhat limited		Somewhat limited		Very limited	

AGRICULTURAL WASTE MANAGEMENT--Continued  
Douglas County, Kansas

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Map symbol and soil name	Pct of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SVV: Sibleyville-----	45	Depth to bedrock	0.71	Depth to bedrock	0.71	Too steep for surface application	1.00
		Droughty	0.43	Droughty	0.43	Depth to bedrock	0.71
		Slope	0.37	Slope	0.37	Too steep for sprinkler application	0.59
						Droughty	0.43
Vinland-----	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to bedrock	0.54	Depth to bedrock	0.54	Depth to bedrock	0.54
		Droughty	0.14	Droughty	0.14	Too steep for surface application	0.31
						Droughty	0.14
Sw: Sogn-----	55	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Droughty	0.66	Droughty	0.66	Droughty	0.66
		Runoff limitation	0.40			Too steep for surface application	0.31
Vinland-----	30	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Droughty	0.93	Droughty	0.93	Too steep for surface application	1.00
		Runoff limitation	0.40	Slope	0.37	Droughty	0.93
Sx: Rock Outcrop-----	60	Slope	0.37			Too steep for sprinkler application	0.59
		Not rated		Not rated		Not rated	
Vinland-----	26	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00	Too steep for surface application	1.00
		Droughty	0.93	Droughty	0.93	Too steep for sprinkler application	1.00
Tc: Thurman-----	35	Runoff limitation	0.40			Droughty	0.93
		Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Leaching limitation	0.45	Droughty	0.19	Too steep for surface application	0.91
VA: Verdigris-----	88	Droughty	0.19			Droughty	0.19
						Too steep for sprinkler application	0.02
Vc: Vinland-----	50	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
Vh: Vinland-----	60	Droughty	0.92	Droughty	0.92	Droughty	0.92
		Runoff limitation	0.40			Too steep for surface application	0.31
		Very limited		Very limited		Very limited	

AGRICULTURAL WASTE MANAGEMENT--Continued  
Douglas County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Vm: Vinland-----	40	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Droughty	0.93	Droughty	0.93	Droughty	0.93
		Runoff limitation	0.40			Too steep for surface application	0.31
Martin-----	25	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Droughty	0.93	Droughty	0.93	Too steep for surface application	1.00
		Runoff limitation	0.40	Slope	0.37	Droughty	0.93
W: Water (< 40 Acres)--	100	Slope	0.37			Too steep for sprinkler application	0.59
		Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too steep for surface application	1.00
Wc: Wabash-----	88	Slope	0.04	Too acid	0.14	Depth to saturated zone	1.00
		Too acid	0.03	Slope	0.04	Too steep for sprinkler application	0.22
						Too acid	0.14
Wh: Wabash-----	90	Very limited		Very limited		Very limited	
		Slope	1.00	Low adsorption	1.00	Low adsorption	1.00
		Low adsorption	1.00	Slope	1.00	Too steep for surface application	1.00
						Too steep for sprinkler application	1.00
Wo: Woodson-----	90	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	0.60	Flooding	1.00	Flooding	0.60
Ws: Woodson-----	90	Runoff limitation	0.40				
		Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Wx: Woodson, eroded----	90	Flooding	0.60	Flooding	1.00	Flooding	0.60
		Runoff limitation	0.40				
		Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
Wx: Woodson, eroded----	90	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Runoff limitation	0.40	Too acid	0.14	Too acid	0.14
		Too acid	0.03				
Wx: Woodson, eroded----	90	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Runoff limitation	0.40	Too acid	0.14	Too acid	0.14
Wx: Woodson, eroded----	90	Too acid	0.03				

WIN-PST SPISP II  
SOIL SENSITIVITY TO PESTICIDE LOSS RATING REPORT

Soils Data Table: SOIL\_KS Sort Order: MUSYM

Douglas County, Kansas: KS045

MUSYM/SEQ#	COMPONENT/TEXTURE/MU%	HYD	KFACT	SURFACE DEPTH	% OM	SPISP II Ratings		
						Leaching (SLP)	Solution Runoff (SSRP)	Adsorbed Runoff (SARP)
059BC 1	BATES L 85%	B	0.28	11"	2.5%	I	I	I
059BD 1	BATES L 50%	B	0.32	15"	2.5%	I	I	I
059BD 2	COLLINSVILLE L 35%	D	0.32	6"	2.0%	V	H	H
059BH 1	BATES L 50%	B	0.32	19"	2.5%	L	I	I
059BH 2	COLLINSVILLE L 35%	D	0.32	11"	2.0%	V	H	H
059BS 1	BOLIVAR L 50%	B	0.24	13"	1.8%	I	I	I
059BS 2	HECTOR L 40%	D	0.24	9"	1.3%	V	H	H
059CM 1	CLARESON SICL 55%	C	0.32	7"	3.3%	L	H	H
059CM 2	ERAM SICL 30%	C	0.37	7"	2.0%	H (w)	H	H
059DN 1	DENNIS SIL 60%	C	0.43	10"	2.0%	H (w)	H	H
059DN 2	BATES L 30%	B	0.32	19"	2.5%	L	I	I
059EA 1	ERAM SICL 55%	C	0.37	7"	2.0%	H (w)	H	H
059EA 2	LEBO SICL 35%	B	0.32	14"	2.5%	I	I	I
059EC 1	ERAM SICL 60%	C	0.37	7"	2.0%	H (w)	H	H
059EC 2	LULA SIL 25%	B	0.37	7"	2.0%	I	I	I
059LN 1	LEBO ST-SICL 75%	B	0.24	7"	2.5%	I	I	H (s)
059LN 2	ROCK OUTCROP 15%	D	0.00	0"	0.0%	V	H	L
059MB 1	MASON SIL 85%	B	0.37	6"	2.0%	I	I	I
059OS 1	OSAGE SICL 85%	D	0.28	6"	2.8%	H (w)	H	H
059VB 1	VERDIGRIS SIL 90%	B	0.32	9"	3.0%	I	I	I
087EC 1	EUDORA FSL 65%	B	0.32	6"	0.8%	H	I	I
087EC 2	BISMARCKGROVE FSL 20%	B	0.32	7"	0.8%	H	I	I
087FU 1	Fluvaquents SIL 95%	B	0.37	7"	1.5%	H (w)	I	I
091MC 1	MORRILL L 85%	B	0.32	13"	3.0%	I	I	I
1120 1	BELVUE SIL 75%	B	0.32	6"	2.0%	I	I	I
1126 1	BISMARCKGROVE SICL 60%	B	0.32	7"	3.0%	I	I	I
1126 2	KIMO SICL 20%	C	0.37	7"	3.0%	H (w)	H	H
139CM 1	CLARESON SICL 55%	C	0.32	8"	3.3%	L	H	H

WIN-PST SPISP II  
SOIL SENSITIVITY TO PESTICIDE LOSS RATING REPORT

Soils Data Table: SOIL\_KS Sort Order: MUSYM

Douglas County, Kansas: KS045

139CM 2	ERAM SICL 30%	C	0.37	9"	2.0% H (w)	H	H
139ED 1	ELMONT L 85%	B	0.32	8"	3.0% I	I	I
139LU 1	LULA SIL 85%	C	0.37	8"	2.0% L	H	H
1659 1	EUDORA SIL 55%	B	0.32	6"	1.5% H	I	I
1659 2	BISMARCKGROVE SICL 25%	B	0.32	7"	3.0% I	I	I
1660 1	EUDORA SIL 55%	B	0.32	8"	1.8% I	I	I
1660 2	BISMARCKGROVE SIL 30%	B	0.32	6"	2.3% I	I	I
177MF 1	MARTIN SICL 90%	C	0.37	12"	3.0% H (w)	H	H
177SW 1	STONY STEEP LAND 60%		0.00	0"	0.0% ?	?	?
177SW 2	VINLAND SICL 26%	D	0.32	11"	3.0% V	H	H (s)
2326 1	KENOMA SIL 90%	D	0.43	4"	3.0% H (w)	H	H
2540 1	LEANNA SIL 85%	D	0.32	10"	3.0% H (w)	H	H
2797 1	MORRILL GR-L 86%	B	0.20	10"	3.0% I	I	H (s)
3460 1	SIBLEYVILLE L 50%	B	0.28	7"	2.5% I	I	I
3460 2	VINLAND L 35%	D	0.28	7"	3.0% V	H	H
3461 1	SIBLEYVILLE L 85%	B	0.28	5"	2.5% I	I	I
3462 1	SIBLEYVILLE L 85%	B	0.28	7"	2.5% I	I	I
3494 1	SUMMIT SICL 85%	C	0.37	9"	2.5% H (w)	H	H
3495 1	SUMMIT SICL 85%	C	0.37	9"	2.5% H (w)	H	H
3815 1	VERDIGRIS SIL 85%	B	0.32	9"	3.0% I	I	I
3926 1	WATER (LESS THAN 40 100%		0.00	0"	0.0% ?	?	?
3951 1	WOODSON SIL 85%	D	0.43	10"	2.5% H (w)	H	H
601KW 1	KONAWA FSL 90%	B	0.24	19"	1.5% I	I	H (s)
601SA 1	SARPY LFS 55%	A	0.17	9"	0.6% H	L	L
601SA 2	HAYNIE VFSL 35%	B	0.37	8"	1.5% I	I	I
AED 1	ARENTS, EARTHEN DAM 100%		0.00	0"	0.0% ?	?	?
Be 1	BASEHOR L 50%	D	0.32	12"	0.8% V	H	H
BOP 1	BORROW PITS 100%		0.00	0"	0.0% ?	?	?
Et 1	EUDORA SIL 90%	B	0.32	12"	1.5% I	I	I



WIN-PST SPISP II  
SOIL SENSITIVITY TO PESTICIDE LOSS RATING REPORT

Soils Data Table: SOIL\_KS Sort Order: MUSYM

Douglas County, Kansas: KS045

Ev 1	EUDORA SIL 60%	B	0.32	12"	2.5% I	I	I
Ev 2	KIMO SICL 30%	C	0.37	6"	3.0% H (w)	H	H
Gm 1	GYMER SIL 85%	C	0.32	15"	3.0% L	H	H
Gy 1	GYMER SIL 88%	C	0.32	15"	3.0% L	H	H
KA 1	ALLUVIAL LAND SIL 100%	B	0.28	45"	3.0% L	I	I
Kb 1	KENNEBEC SIL 97%	B	0.28	48"	4.0% L	I	I
Kc 1	KENNEBEC SICL 88%	B	0.28	10"	4.0% I	I	I
Le 1	LEANNA SIL 85%	D	0.32	10"	3.0% H (w)	H	H
Mb 1	MARTIN SICL 90%	C	0.37	9"	3.0% H (w)	H	H
Mc 1	MARTIN SICL 85%	C	0.37	9"	3.0% H (w)	H	H
Mh 1	MARTIN SICL 85%	C	0.37	9"	2.5% L	H	H
Mo 1	MARTIN SICL 40%	C	0.37	9"	3.0% H (w)	H	H
Mo 2	OSKA SICL 30%	C	0.37	5"	2.5% L	H	H
Mr 1	MORRILL CL 90%	B	0.28	10"	3.0% I	I	I
Ms 1	MORRILL CL 85%	B	0.28	10"	2.5% I	I	I
Oe 1	OSKA SICL 88%	C	0.37	5"	2.5% L	H	H
Pb 1	PAWNEE CL 90%	D	0.37	14"	3.0% H (w)	H	H
Pc 1	PAWNEE CL 85%	D	0.37	14"	3.0% H (w)	H	H
Ph 1	PAWNEE CL 90%	D	0.37	14"	3.0% H (w)	H	H
QUA 1	QUARRIES 100%		0.00	0"	0.0% ?	?	?
Re 1	READING SIL 90%	B	0.32	15"	3.0% L	I	I
Ro 1	RIVER WASH 100%		0.00	0"	0.0% ?	?	?
Sb 1	SARPY LFS 55%	A	0.17	12"	0.7% H	L	L
Sb 2	EUDORA FSL 45%	B	0.20	8"	0.8% H	I	I
Sc 1	SHARPSBURG SIL 88%	B	0.32	12"	3.0% I	I	I
Sd 1	SHARPSBURG SIL 85%	B	0.32	12"	3.0% I	I	I
Sh 1	WOODSON SIL 90%	D	0.43	11"	3.0% H (w)	H	H
So 1	SIBLEYVILLE L 85%	B	0.28	5"	2.5% I	I	I
Ss 1	SIBLEYVILLE L 60%	B	0.28	7"	2.5% I	I	I
Ss 2	Unnamed series 1 - shallow L 25%	B	0.28	7"	2.5% I	I	I

WIN-PST SPISP II  
SOIL SENSITIVITY TO PESTICIDE LOSS RATING REPORT

Soils Data Table: SOIL\_KS Sort Order: MUSYM

Douglas County, Kansas: KS045

St 1	SIBLEYVILLE L 50%	B	0.28	7"	2.5% I	I	I
St 2	Unnamed series 1 - shallow L 40%	B	0.28	7"	2.5% I	I	I
SU 1	SUMMIT SICL 90%	C	0.37	8"	3.0% H (w)	H	H
Sv 1	SIBLEYVILLE L 50%	B	0.28	7"	2.5% I	I	I
SVV 1	SIBLEYVILLE L 50%	B	0.28	7"	2.5% I	I	I
SVV 2	VINLAND L 30%	D	0.28	7"	3.0% V	H	H
Sw 1	SOGN SICL 55%	D	0.32	12"	2.0% V	H	H (s)
Sw 2	VINLAND SICL 30%	D	0.32	7"	3.0% V	H	H
Sx 1	ROCK OUTCROP UWB 60%		0.00	5"	0.0% ?	?	?
Sx 2	VINLAND SICL 26%	D	0.32	7"	3.0% V	H	H (s)
Tc 1	THURMAN LS 35%	A	0.17	22"	1.5% I	L	L
Tc 2	unnamed series - coarse-loamy sl 30%	A	0.20	22"	1.9% I	L	L
Tc 3	unnamed series - fine-loamy sl 25%	A	0.20	22"	2.0% I	L	L
VA 1	VERDIGRIS SIL 88%	B	0.32	7"	3.0% I	I	I
Vc 1	VINLAND SICL 50%	D	0.32	12"	3.0% V	H	H
Vc 2	VINLAND-like SICL 30%	C	0.32	9"	3.0% L	H	H
Vh 1	VINLAND SICL 60%	D	0.32	7"	3.0% V	H	H
Vm 1	VINLAND SICL 40%	D	0.32	7"	3.0% V	H	H
Vm 2	MARTIN SICL 25%	C	0.37	9"	3.0% H (w)	H	H
W 1	WATER (< 40 ACRES) 100%		0.00	0"	0.0% ?	?	?
Wc 1	WABASH SICL 88%	D	0.28	16"	3.3% H (w)	H	H
Wh 1	WABASH SIC 90%	D	0.28	16"	3.3% H (w)	H	H
Wo 1	WOODSON SIL 90%	D	0.43	11"	3.0% H (w)	H	H
Ws 1	WOODSON SIL 90%	D	0.43	11"	3.0% H (w)	H	H
Wx 1	WOODSON SICL 90%	D	0.37	8"	3.0% H (w)	H	H

(.\REPORTS\SOILS.TXT generated on 12/12/01 at 12:11:15)

H -- High  
I -- Intermediate  
L -- Low  
V -- Very Low

Conditions that affect ratings:

- m -- There are macropores in the surface horizon deeper than 24"
- w -- The high water table comes within 24" of the surface during the growing season
- s -- The field slope is greater than 15%

SPISP II S-Ratings:

- SLP -- Soil Leaching Potential
- SSRP -- Soil Solution Runoff Potential
- SARP -- Soil Adsorbed Runoff Potential

In this section, hydric soils are defined and described and the hydric soils in the survey area are listed. The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for each of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 1995). These criteria are used to identify a phase of a soil series that normally is associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (USDA, 1999) and "Keys to Soil Taxonomy" (USDA, 1998) and in the "Soil Survey Manual" (USDA, 1993).

If soils are wet enough for a long enough period to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils in this survey area are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and others, 1996).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

Map units in the Hydric Soil Interpretations table meet the definition of hydric soils and, in addition, have at least one of the hydric soil indicators. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 1996).

Map units that are made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

These map units, in general, do not meet the definition of hydric soils because they do not have one of the hydric soil indicators. A portion of these map units, however, may include hydric soils. Onsite investigation is recommended to determine whether hydric soils occur and the location of the included hydric soils.

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Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
059BC: BATES LOAM, 1 TO 4 PERCENT SLOPES	BATES	No	hillslope	---	---	---	---
	DENNIS KENOMA	No Unranked	hillslope hillslope	---	---	---	---
059BD: BATES-COLLINSVILLE LOAMS, 3 TO 7 PERCENT SLOPES	BATES	No	hillslope	---	---	---	---
	COLLINSVILLE	No	hillslope	---	---	---	---
	DENNIS	No	hillslope	---	---	---	---
	ERAM	No	hillslope	---	---	---	---
	OLPE	No	paleoterrace	---	---	---	---
059BH: BATES-COLLINSVILLE LOAMS, 7 TO 12 PERCENT SLOPES	BATES	No	hillslope	---	---	---	---
	COLLINSVILLE	No	hillslope	---	---	---	---
	DENNIS	No	hillslope	---	---	---	---
	ERAM	No	hillslope	---	---	---	---
	OLPE	No	paleoterrace	---	---	---	---
059BS: BOLIVAR-HECTOR LOAMS, 6 TO 12 PERCENT SLOPES	BOLIVAR	No	hillslope	---	---	---	---
	HECTOR WELDA	No Unranked	hillslope hillslope	---	---	---	---
059CM: CLARESON-ERAM SILTY CLAY LOAMS, 3 TO 15 PERCENT SLOPES	CLARESON	No	hillslope	---	---	---	---
	ERAM	No	hillslope	---	---	---	---
	BATES	No	hillslope	---	---	---	---
	ROCK OUTCROP	Unranked	hillslope	---	---	---	---
059DN: DENNIS-BATES COMPLEX, 2 TO 6 PERCENT SLOPES	DENNIS	No	hillslope	---	---	---	---
	BATES	No	hillslope	---	---	---	---
	ERAM	No	hillslope	---	---	---	---
	OSAGE	Yes	flood plain	2B3	YES	NO	NO
059EA: ERAM-LEBO SILTY CLAY LOAMS, 7 TO 12 PERCENT SLOPES	ERAM	No	hillslope	---	---	---	---
	LEBO	No	hillslope	---	---	---	---
	CLARESON	No	hillslope	---	---	---	---
	DENNIS	No	hillslope	---	---	---	---
059EC: ERAM-LULA COMPLEX, 3 TO 7 PERCENT SLOPES	ERAM	No	hillslope	---	---	---	---
	LULA	No	hillslope	---	---	---	---
	BATES	No	hillslope	---	---	---	---
	KENOMA OLPE	Unranked No	hillslope paleoterrace	---	---	---	---
059LN: LEBO-ROCK OUTCROP COMPLEX, 20 TO 40 PERCENT SLOPES	LEBO	No	hillslope	---	---	---	---
	ROCK OUTCROP CLARESON	Unranked No	ridge hillslope	---	---	---	---
059MB: MASON SILT LOAM, 0 TO 2 PERCENT SLOPES, RARELY FLOODED	MASON	No	stream terrace	---	---	---	---
	OSAGE WELDA	Yes Unranked	flood plain hillslope	2B3 ---	YES ---	NO ---	NO ---
059OS: OSAGE SILTY CLAY LOAM, 0 TO 2 PERCENT SLOPES, OCCASIONALLY FLOODED	OSAGE	Yes	flood plain	2B3	YES	NO	NO
	LEANNA	No	flood plain	---	---	---	---
	MASON VERDIGRIS	No No	stream terrace flood plain	---	---	---	---
059VB: VERDIGRIS SILT LOAM, 0 TO 2 PERCENT SLOPES, OCCASIONALLY FLOODED	VERDIGRIS	No	flood plain	---	---	---	---
	LEANNA	No	flood plain	---	---	---	---
	MASON OSAGE	No Yes	stream terrace flood plain	---	---	---	---

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Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
087EC: EUDORA-BISMARCKGROVE COMPLEX, 0 TO 3 PERCENT SLOPES, OVERWASH, OCCASIONALLY FLOODED	EUDORA	No	flood-plain step	---	---	---	---
	BISMARCKGROVE	No	flood-plain step	---	---	---	---
	BOURBONAIS	No	flood-plain step	---	---	---	---
	KIMO STONEHOUSE	No	meander scar flood-plain step	---	---	---	---
087FU: FLUVAQUENTS	Fluvaquents	No	flood plain	4	NO	YES	NO
087MU: MUSCOTAH SILTY CLAY LOAM, 0 TO 1 PERCENT SLOPES, VERY RARELY FLOODED	MUSCOTAH	No	terrace	---	---	---	---
	READING	No	terrace	---	---	---	---
	ROSSVILLE WABASH	No	terrace	---	---	---	---
091EB: EUDORA SOILS, OVERWASH, RARELY FLOODED	EUDORA	No	flood plain	2B3	YES	NO	NO
091MC: MORRILL LOAM, 3 TO 8 PERCENT SLOPES	MORRILL	No	hillslope	---	---	---	---
	GRUNDY LADOGA	No	hillslope	---	---	---	---
139CM: CLARESON-ERAM COMPLEX, 3 TO 15 PERCENT SLOPES	CLARESON	No	hillslope	---	---	---	---
	ERAM	No	hillslope	---	---	---	---
	ROCK OUTCROP BATES	Unranked	hillslope	---	---	---	---
139ED: ELMONT LOAM, 3 TO 7 PERCENT SLOPES	ELMONT	No	hillslope	---	---	---	---
	ERAM KENOMA	No	hillslope	---	---	---	---
139LU: LULA SILT LOAM, 1 TO 3 PERCENT SLOPES	LULA	No	hillslope	---	---	---	---
	DWIGHT	No	hillslope	---	---	---	---
	ERAM	No	hillslope	---	---	---	---
	KENOMA	No	divide	---	---	---	---
177MF: MARTIN SILTY CLAY LOAM, 7 TO 11 PERCENT SLOPES	MARTIN	No	hillslope	---	---	---	---
	ELMONT MARTIN	No	hillslope	---	---	---	---
177SW: VINLAND-ROCK OUTCROP COMPLEX, 15 TO 45 PERCENT SLOPES	STONY STEEP LAND	Unranked	hillslope	---	---	---	---
	VINLAND	No	hillslope	---	---	---	---
	SOGN	No	hillslope	---	---	---	---
	LABETTE	No	hillslope	---	---	---	---
601KW: KONAWA FINE SANDY LOAM, 8 TO 20 PERCENT SLOPES	MARTIN	No	hillslope	---	---	---	---
	KONAWA	No	hillslope	---	---	---	---
601SA: SARPY-HAYNIE COMPLEX, 0 TO 3 PERCENT SLOPES, OCCASIONALLY FLOODED	GYMER	No	hillslope	---	---	---	---
	WELDA	No	terrace	---	---	---	---
	SARPY	No	flood plain	---	---	---	---
	HAYNIE unnamed soil	No	flood plain	---	---	---	---
2326: KENOMA SILT LOAM, 1 TO 4 PERCENT SLOPES	KENOMA	Unranked	hillslope	---	---	---	---
	ERAM	Unranked	hillslope	---	---	---	---
	WOODSON	Unranked	hillslope	---	---	---	---

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Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
2540: LEANNA SILT LOAM, 0 TO 2 PERCENT SLOPES, OCCASIONALLY FLOODED	LEANNA	Unranked	flood plain	---	---	---	---
	MASON	Unranked	stream terrace	---	---	---	---
	OSAGE	Unranked	flood plain	2B3,3	YES	NO	YES
	VERDIGRIS	Unranked	flood plain	---	---	---	---
2797: MORRILL-GRAVELLY LOAM, 4 TO 20 PERCENT SLOPES, STONY	MORRILL	No	hillslope	---	---	---	---
	SOGN	No	hillslope	---	---	---	---
	PAWNEE	No	hillslope	---	---	---	---
3460: SIBLEYVILLE-VINLAND COMPLEX, 7 TO 15 PERCENT SLOPES	SIBLEYVILLE	Unranked	hillslope	---	---	---	---
	VINLAND	Unranked	hillslope	---	---	---	---
	BUCYRUS	Unranked	hillslope	---	---	---	---
	SUMMIT	Unranked	hillslope	---	---	---	---
3461: SIBLEYVILLE LOAM, 3 TO 7 PERCENT SLOPES, ERODED	SIBLEYVILLE	Unranked	hillslope	---	---	---	---
	WOODSON	Unranked	hillslope	---	---	---	---
	SUMMIT	Unranked	hillslope	---	---	---	---
3462: SIBLEYVILLE LOAM, 3 TO 7 PERCENT SLOPES	SIBLEYVILLE	Unranked	hillslope	---	---	---	---
	WOODSON	Unranked	hillslope	---	---	---	---
	SUMMIT	Unranked	hillslope	---	---	---	---
3464: SIBLEYVILLE-VINLAND LOAMS, 3 TO 7 PERCENT SLOPES	SIBLEYVILLE	Unranked	hillslope	---	---	---	---
	VINLAND	Unranked	hillslope	---	---	---	---
	SHIDLER	---	hillslope	---	---	---	---
	SUMMIT	Unranked	hillslope	---	---	---	---
3494: SUMMIT SILTY CLAY LOAM, 1 TO 4 PERCENT SLOPES	SUMMIT	No	hillslope	---	---	---	---
	KENOMA	Unranked	hillslope	---	---	---	---
	WAGSTAFF	Unranked	hillslope	---	---	---	---
3495: SUMMIT SILTY CLAY LOAM, 4 TO 8 PERCENT SLOPES	SUMMIT	Unranked	hillslope	---	---	---	---
	DENNIS	Unranked	hillslope	---	---	---	---
	SHIDLER	---	hillslope	---	---	---	---
	WAGSTAFF	Unranked	hillslope	---	---	---	---
3815: VERDIGRIS SILT LOAM, 0 TO 2 PERCENT SLOPES, FREQUENTLY FLOODED	VERDIGRIS	Unranked	flood plain	---	---	---	---
	SUMMIT	Unranked	hillslope	---	---	---	---
	OSAGE	Unranked	flood plain	2B3,3	YES	NO	YES
3926: WATER	WATER (LESS THAN 40	Unranked	---	---	---	---	---
3951: WOODSON SILT LOAM, 1 TO 3 PERCENT SLOPES	WOODSON	Unranked	paleoterrace	---	---	---	---
	KENOMA	Unranked	hillslope	---	---	---	---
	SUMMIT	Unranked	hillslope	---	---	---	---
AED: ARENTS, EARTHEN DAM	ARENTS, EARTHEN DAM	Unranked	---	---	---	---	---
Be: BASEHOR COMPLEX, 7 TO 15 PERCENT SLOPES	BASEHOR	No	hillslope	---	---	---	---
	unnamed soil	No	hillslope	---	---	---	---
	unnamed soil	No	hillslope	---	---	---	---
	VINLAND	No	hillslope	---	---	---	---
	ROCK OUTCROP	No	hillslope	---	---	---	---
BOP: BORROW PITS	BORROW PITS	Unranked	---	---	---	---	---
Et: EUDORA SILT LOAM, RARELY FLOODED	EUDORA	No	flood plain	---	---	---	---
	KIMO	No	flood plain	---	---	---	---
	SARPY	No	flood plain	---	---	---	---
	UNNAMED	Yes	depression, flood plain	2B3	YES	NO	NO
	HYDRIC SOIL						

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Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
Ev: EUDORA-KIMO COMPLEX, RARELY FLOODED	EUDORA	No	flood plain	---	---	---	---
	KIMO	No	flood plain	---	---	---	---
	SARPY	No	flood plain	---	---	---	---
	WABASH	Yes	flood plain	2B3	YES	NO	NO
Ew: EUDORA-KIMO FINE SANDY LOAMS, RARELY FLOODED, OVERWASH	EUDORA	No	flood plain	---	---	---	---
	KIMO SARPY	No No	flood plain ---	---	---	---	---
Gm: GYMER SILT LOAM, 1 TO 3 PERCENT SLOPES	GYMER	No	hillslope	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
	OSKA	No	hillslope	---	---	---	---
	WABASH	Yes	terrace	3	NO	NO	YES
Gy: GYMER SILT LOAM, 3 TO 8 PERCENT SLOPES	GYMER	No	terrace	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
	MORRILL	No	hillslope	---	---	---	---
	SHARPSBURG THURMAN	No No	hillslope hillslope	---	---	---	---
Ju: JUDSON SILT LOAM, RARELY FLOODED	JUDSON	No	terrace	---	---	---	---
	EUDORA	No	flood plain	---	---	---	---
	READING WABASH	No Yes	terrace terrace	3	NO	NO	YES
KA: KENNEBEC SILT LOAM, CHANNELED	KENNEBEC	No	flood plain	---	---	---	---
	BREMER	Yes	depression	2B3	YES	NO	NO
Kb: KENNEBEC SILT LOAM, OCCASIONALLY FLOODED	KENNEBEC	No	flood plain	---	---	---	---
	WABASH	Yes	flood plain	2B3	YES	NO	NO
	UNNAMED HYDRIC SOIL	Yes	flood plain, marsh	2B3	YES	NO	NO
Kc: KENNEBEC SOILS, CHANNELED	KENNEBEC	No	flood plain	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
	SOGN	No	hillslope	---	---	---	---
	VINLAND WABASH	No Yes	hillslope flood plain	---	---	---	---
Km: KIMO SILTY CLAY LOAM, RARELY FLOODED	KIMO	No	flood plain	---	---	---	---
	EUDORA WABASH	No Yes	flood plain flood plain	---	---	---	---
Le: LEANNA SILT LOAM, 0 TO 2 PERCENT SLOPES, OCCASIONALLY FLOODED	LEANNA	No	flood plain	---	---	---	---
	KENNEBEC	No	flood plain	---	---	---	---
	READING WABASH	No Yes	terrace depression	---	---	---	---
M-W: MISCELLANEOUS WATER	MISCELLANEOUS WATER	---	---	---	---	---	---
Mb: MARTIN SILTY CLAY LOAM, 1 TO 3 PERCENT SLOPES	MARTIN	No	hillslope	---	---	---	---
	PAWNEE WOODSON	No No	hillslope hillslope	---	---	---	---
Mc: MARTIN SILTY CLAY LOAM, 3 TO 7 PERCENT SLOPES	MARTIN	No	hillslope	---	---	---	---
	GYMER	No	hillslope	---	---	---	---
	OSKA	No	hillslope	---	---	---	---
	PAWNEE	No	hillslope	---	---	---	---
	SOGN	No	hillslope	---	---	---	---
	VINLAND	No	hillslope	---	---	---	---
	SIBLEYVILLE	No	hillslope	---	---	---	---



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Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
Mh: MARTIN SOILS, 3 TO 7 PERCENT SLOPES, ERODED	MARTIN	No	hillslope	---	---	---	---
	SIBLEYVILLE	No	hillslope	---	---	---	---
	SOGN	No	hillslope	---	---	---	---
	VINLAND	No	hillslope	---	---	---	---
	PAWNEE	No	hillslope	---	---	---	---
Mo: MARTIN-OSKA SILTY CLAY LOAMS, 3 TO 6 PERCENT SLOPES	MARTIN	No	hillslope	---	---	---	---
	OSKA	No	hillslope	---	---	---	---
	Unnamed soils	No	hillslope	---	---	---	---
	SOGN	No	hillslope	---	---	---	---
	VINLAND	No	hillslope	---	---	---	---
Mr: MORRILL CLAY LOAM, 3 TO 7 PERCENT SLOPES	MORRILL	No	hillslope	---	---	---	---
	OSKA	No	hillslope	---	---	---	---
	PAWNEE	No	hillslope	---	---	---	---
Ms: MORRILL CLAY LOAM, 7 TO 12 PERCENT SLOPES	MORRILL	No	hillslope	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
	PAWNEE	No	hillslope	---	---	---	---
	THURMAN	No	hillslope	---	---	---	---
	BASEHOR	No	hillslope	---	---	---	---
Oe: OSKA SILTY CLAY LOAM, 3 TO 6 PERCENT SLOPES	OSKA	No	hillslope	---	---	---	---
	GYMER	No	hillslope	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
	SOGN	No	hillslope	---	---	---	---
	VINLAND	No	hillslope	---	---	---	---
Pb: PAWNEE CLAY LOAM, 1 TO 3 PERCENT SLOPES	PAWNEE	No	hillslope	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
	WOODSON	No	divide	---	---	---	---
Pc: PAWNEE CLAY LOAM, 3 TO 7 PERCENT SLOPES	PAWNEE	No	hillslope	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
	MORRILL	No	hillslope	---	---	---	---
	OSKA	No	hillslope	---	---	---	---
Ph: PAWNEE CLAY LOAM, 3 TO 7 PERCENT SLOPES, ERODED	PAWNEE	No	hillslope	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
	MORRILL	No	hillslope	---	---	---	---
QUA: QUARRIES	QUARRIES	Unranked	---	---	---	---	---
Re: READING SILT LOAM, 0 TO 2 PERCENT SLOPES, RARELY FLOODED	READING	No	terrace	---	---	---	---
	CHASE	No	terrace	---	---	---	---
	WABASH	Yes	terrace	2B3	YES	NO	NO
Ro: RIVERWASH	RIVER WASH	Unranked	---	---	---	---	---
Sa: SAND PIT	SAND PIT	Unranked	---	---	---	---	---
Sb: SARPY-EUDORA COMPLEX, OVERWASH, OCCASIONALLY FLOODED	SARPY	No	flood plain	---	---	---	---
	EUDORA	No	flood plain	---	---	---	---
Sc: SHARPSBURG SILT LOAM, 1 TO 4 PERCENT SLOPES	SHARPSBURG	No	hillslope	---	---	---	---
	GYMER	No	terrace	---	---	---	---
	MORRILL	No	hillslope	---	---	---	---
	PAWNEE	No	hillslope	---	---	---	---
	WOODSON	No	divide	---	---	---	---
Sd: SHARPSBURG SILT LOAM, 4 TO 10 PERCENT SLOPES	SHARPSBURG	No	hillslope	---	---	---	---
	GYMER	No	terrace	---	---	---	---
	MORRILL	No	hillslope	---	---	---	---
	PAWNEE	No	hillslope	---	---	---	---

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All mapunits are displayed regardless of hydric status and are listed in alpha-numeric order by mapunit symbol. The "Hydric Soils Criteria" columns indicate the conditions that caused the mapunit component to be classified as "Hydric" or "Non-Hydric". These criteria are defined in "Hydric Soils of the United States" (USDA Miscellaneous Publication No. 1491, June, 1991). See the "Criteria for Hydric Soils" endnote to determine the meaning of these columns. Spot symbols are footnoted at the end of the table.

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
Sh: SIBLEYVILLE LOAM, 3 TO 7 PERCENT SLOPES	SIBLEYVILLE	No	hillslope	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
So: SIBLEYVILLE LOAM, 3 TO 7 PERCENT SLOPES, ERODED	WOODSON	No	hillslope divide	---	---	---	---
	SIBLEYVILLE	Unranked	hillslope	---	---	---	---
Ss: SIBLEYVILLE COMPLEX, 3 TO 7 PERCENT SLOPES	WOODSON	Unranked	hillslope	---	---	---	---
	SUMMIT	Unranked	hillslope	---	---	---	---
St: SIBLEYVILLE COMPLEX, 3 TO 7 PERCENT SLOPES, ERODED	SIBLEYVILLE	No	hillslope	---	---	---	---
	Unnamed series 1 - shallow	No	hillslope	---	---	---	---
	Unnamed series 2 - deep	No	hillslope	---	---	---	---
	BASEHOR	No	hillslope	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
	VINLAND	No	hillslope	---	---	---	---
	WOODSON	No	hillslope divide	---	---	---	---
	SIBLEYVILLE	No	hillslope	---	---	---	---
SU: SUMMIT SILTY CLAY LOAM, 3 TO 7 PERCENT SLOPES	Unnamed series 1 - shallow	No	hillslope	---	---	---	---
	Unnamed series 2 - deep	No	hillslope	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
	VINLAND	No	hillslope	---	---	---	---
	SUMMIT	No	hillslope	---	---	---	---
	CLARESON	No	hillslope	---	---	---	---
	LEBO	No	hillslope	---	---	---	---
	LULA	No	hillslope	---	---	---	---
Sv: SIBLEYVILLE COMPLEX, 7 TO 15 PERCENT SLOPES	SIBLEYVILLE	No	hillslope	---	---	---	---
	Unnamed series 1 - shallow	No	hillslope	---	---	---	---
	Unnamed series 2 - deep	No	hillslope	---	---	---	---
	VINLAND	No	hillslope	---	---	---	---
	GYMER	No	hillslope	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
	SIBLEYVILLE	No	hillslope	---	---	---	---
	VINLAND	No	hillslope	---	---	---	---
SVV: SIBLEYVILLE-VINLAND LOAMS, 3 TO 7 PERCENT SLOPES	MARTIN	No	hillslope	---	---	---	---
	SOGN	No	hillslope	---	---	---	---
	SIBLEYVILLE	No	hillslope	---	---	---	---
Sw: SOGN-VINLAND COMPLEX, 5 TO 20 PERCENT SLOPES	VINLAND	No	hillslope	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
	SOGN	No	hillslope	---	---	---	---
	VINLAND	No	hillslope	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
Sx: VINLAND-ROCK OUTCROP COMPLEX, 20 TO 40 PERCENT SLOPES	OSKA	No	hillslope	---	---	---	---
	SIBLEYVILLE	No	hillslope	---	---	---	---
	ROCK OUTCROP	No	hillslope	---	---	---	---
	VINLAND	No	hillslope	---	---	---	---
	SOGN	No	hillslope	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
	OSKA	No	hillslope	---	---	---	---

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Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
Tc: THURMAN COMPLEX, 4 TO 10 PERCENT SLOPES	THURMAN	No	hillslope	---	---	---	---
	unnamed series - coarse-loamy	No	hillslope	---	---	---	---
	unnamed series - fine-loamy	No	hillslope	---	---	---	---
	MORRILL	No	hillslope	---	---	---	---
	GYMER	No	terrace	---	---	---	---
	SHARPSBURG	No	hillslope	---	---	---	---
	VERDIGRIS	No	flood plain	---	---	---	---
VA: VERDIGRIS SILT LOAM, CHANNELED	BATES	No	hillside	---	---	---	---
	ERAM	No	hillside	---	---	---	---
	OSAGE	Yes	flood plain	4,2B3	YES	YES	NO
	ROCK OUTCROP	No	---	---	---	---	---
	VINLAND	No	hillslope	---	---	---	---
Vc: VINLAND COMPLEX, 3 TO 7 PERCENT SLOPES	VINLAND	No	hillslope	---	---	---	---
	VINLAND	No	hillslope	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
	OSKA	No	hillslope	---	---	---	---
	PAWNEE	No	hillslope	---	---	---	---
	SHELBY	No	hillslope	---	---	---	---
	SIBLEYVILLE	No	hillslope	---	---	---	---
	SOGN	No	hillslope	---	---	---	---
Vh: VINLAND COMPLEX, 3 TO 7 PERCENT SLOPES, ERODED	VINLAND	No	hillslope	---	---	---	---
	Unnamed soil	No	hillslope	---	---	---	---
	SOGN	No	hillslope	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
	SIBLEYVILLE	No	hillslope	---	---	---	---
Vm: VINLAND-MARTIN COMPLEX, 7 TO 15 PERCENT SLOPES	VINLAND	No	hillslope	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
	Unnamed soil	No	hillslope	---	---	---	---
	SIBLEYVILLE	No	hillslope	---	---	---	---
	SOGN	No	hillslope	---	---	---	---
W: WATER (LESS THAN 40 ACRES IN SIZE)	WATER (< 40 ACRES)	Unranked	---	---	---	---	---
Wc: WABASH SILTY CLAY LOAM, OCCASIONALLY FLOODED	WABASH	Yes	terrace	3	NO	NO	YES
	KENNEBEC	No	flood plain	---	---	---	---
	LEANNA	Unranked	flood plain	---	---	---	---
	READING	No	terrace	---	---	---	---
Wh: WABASH SILTY CLAY, OCCASIONALLY FLOODED	WABASH	Yes	flood plain	2B3	YES	NO	NO
	WABASH	Yes	terrace	2B3	YES	NO	NO
	READING	No	terrace	---	---	---	---
	WABASH	Yes	flood plain	3	NO	NO	YES
Wo: WOODSON SILT LOAM, 0 TO 1 PERCENT SLOPES	WOODSON	No	divide	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
	PAWNEE	No	hillslope	---	---	---	---
Ws: WOODSON SILT LOAM, 1 TO 3 PERCENT SLOPES	WOODSON	No	divide	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
	PAWNEE	No	hillslope	---	---	---	---
Wx: WOODSON SILTY CLAY LOAM, 1 TO 3 PERCENT SLOPES, ERODED	WOODSON	No	divide	---	---	---	---
	MARTIN	No	hillslope	---	---	---	---
	SIBLEYVILLE	No	hillslope	---	---	---	---

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Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria

FOOTNOTE: There may be small areas of included soils or miscellaneous areas that are significant to use and management of the soil; yet are too small to delineate on the soil map at the map's original scale. These may be designated as spot symbols and are defined in the published Soil Survey Report or the USDA-NRCS Technical Guide, Part II.

Areas mapped as water or any map unit that contains one of the following conventional symbols is considered a hydric soil map unit: marshes or swamps; wet spots; depressions; streams, lakes and ponds.

1. All Histosols except Folists, or
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Aquisalids, Pachic subgroups, or Cumulic subgroups that are:
  - a. Somewhat poorly drained with a water table equal to 0.0 foot (ft) from the surface during the growing season, or
  - b. poorly drained or very poorly drained and have either:
    - (1) water table equal to 0.0 ft during the growing season if textures are coarse sand, sand, or fine sand in all layers within 20 inches (in), or for other soils
    - (2) water table at less than or equal to 0.5 ft from the surface during the growing season if permeability is equal to or greater than 6.0 in/hour (h) in all layers within 20 in, or
    - (3) water table at less than or equal to 1.0 ft from the surface during the growing season if permeability is less than 6.0 in/h in any layer within 20 in, or
3. Soils that are frequently ponded for long duration or very long duration during the growing season, or
4. Soils that are frequently flooded for long duration or very long duration during the growing season.